Youth suicide prevention by primary healthcare professionals

A critical appraisal of the literature

P Hider
ACKNOWLEDGEMENTS

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EXECUTIVE SUMMARY

Objective
This review was commissioned by the Royal New Zealand College of General Practitioners and was designed to assist with the preparation of guidelines for primary care practitioners. The main aims were to assess the literature describing the epidemiology and main risk factors for suicidal behaviour among young people along with a review of the evidence for the recognition, management and prevention of adolescent suicidal behaviour by primary care practitioners.

Data sources

A limited search of Internet sources was undertaken along with the reference lists of publications obtained during the course of the project.

Study selection
Studies were selected and appraised if they met various selection criteria. A wide range of study types was included in this review (including expert opinion articles) and approximately 300 articles were appraised.

Data extraction
Critical appraisal forms standardised by study design were used to assist with the appraisal, which was conducted by a single reviewer. Most appraised articles were included in tables and then presented in the text. The level of evidence was based on an adaptation of the US Preventive Services Task Force protocol.

Data synthesis and conclusions
Epidemiology
The number, and rate, of suicidal deaths among young people has been increasing over the last two decades. Young males between 20-24 years have the highest age-specific death rates by suicide of any age group. Most young people commit suicide by hanging. The suicide rate among young Maori has been lower than non-Maori, although recent data suggests that this may be changing. New Zealand suicide rates are high by international comparison.

Considerably more young people are hospitalised for attempted suicide than complete suicide each year, and approximately four times more young people will attempt suicide but never receive medical care. Attempted suicide is more common among females although death rates are higher for males. From the results of community-based studies, approximately 3.5% of people will have attempted suicide by age 18 years (school-based surveys have recorded a higher number). The results of community-based studies suggest that up to 30% of young people will have experienced severe suicidal ideation by 18 years of age. Young people with persistent severe suicidal ideation are more likely to attempt suicide and those people who have attempted suicide are at increased risk of later suicidal death.
Risk factors

Young people at highest risk of suicide are primarily characterised by:
- high rates of psychiatric illness (especially affective disorders and substance abuse) and the presence of co-morbid mental disorders.

There is also a strong association between the following risk factors and suicidal behaviour among young people:
- low socio-economic status and poor educational background
- previous suicide attempts and persistent suicidal ideation
- family backgrounds with dysfunctional or difficult circumstances, including parental pathopsychology, parental separation, poor inter-familial communication, or sexual and/or physical abuse
- environmental factors and stressful psychosocial life events.

There is a weaker association between suicidal behaviour and the following risk factors:
- personality disorders, impulsive/aggressive personality traits and inflexible thinking or poor problem solving, cognitive ability
- biological factors.

All of these risk factors can be combined in a complex and inter-related model that describes the development and expression of suicidal behaviour among young people.

Identification and assessment

Young people frequently attend a GP close to the time of a suicide attempt. Mental illness and suicide risk among young people often goes unrecognised by the GP, however, the early diagnosis of mental illness is important to improve outcome for young people. A number of societal, GP and patient related factors have been cited by experts as possible causes for the under-recognition of mental illness and suicidality by GPs among young people.

Experts have identified several practices and consultation based techniques that could potentially reduce the barriers to treatment in primary care for young people.

The recognition of those groups of young people most at risk of suicide would be improved if primary care practitioners were vigilant for youth with the main risk factors for suicide (psychiatric illness, disadvantaged backgrounds, psychosocial stresses). The assessment of the suicide risk of the individual is best undertaken by direct questioning of the young person’s wish to die, the lethality of any plans and the consideration of any recent stressful precipitants, in addition a general assessment that includes attention to the details of the person’s past medical, psychiatric and psychosocial history is also pertinent along with a mental status examination.

Psychometric screening tests are not currently helpful for the primary care clinician in formulating their assessment of a young person’s suicide risk.

Management

The management of the suicidal young person in primary care should include the following components:
- adequate background training and referral links should exist for the practitioner
- the young person should be engaged in a therapeutic relationship
- safety should be provided for the young adult
- an effective clinical assessment needs to be made
- an initial decision should be made about whether hospitalisation or referral is needed
- an appropriate treatment(s) needs to be selected
- support for family members and peers needs to be given
- ongoing monitoring of progress and further decisions about any further referrals should be undertaken
- the patient needs to be assisted with a return to full functioning when appropriate.
Interventions to prevent youth suicide in primary care

The prevention of suicidal behaviour by primary care practitioners has been conducted on two levels; population-based interventions are applied to the general population of young people in order to prevent the development of suicidal behaviour by individuals, while targeted interventions aim to prevent suicidal behaviour in those young people established to be at high-risk of suicide.

Population-based interventions

School-based preventive programmes have become common in the United States although there is some uncertainty about their safety and effectiveness. Programmes that target at risk youth appear to have the most promising ability to reduce suicidal behaviour among young people. Lobbying by primary care practitioners for the restriction of the means to suicide among young people and for responsible reporting of suicide events may be able to reduce suicidal behaviour among youths. Office based preventive interventions and education programmes to assist GPs to recognise and treat mental illness appear to be effective interventions. Uncertainty exists in the literature about the ability of primary care practitioners, working in youth clinics to reduce suicidal behaviour among young people.

Targeted interventions to prevent suicidal behaviour among young people

Cognitive behavioural therapy (CBT) and group support can probably prevent suicidal behaviour among young people. However, less evidence is available for the effectiveness of family therapy, crisis intervention and psychoanalysis. Pharmacotherapy appears to be very effective at treating an underlying mental illness but less able to prevent suicidal behaviour in young people. The effectiveness of postvention has not been proven by any clinical trial. However, most experts consider that it is a necessary intervention to both prevent any deaths by imitation and to assist the grieving process for the survivors.

An appreciation of cultural factors was important in the prevention of suicidal behaviour among young people either within population-based or targeted interventions.

Methodological deficiencies in the literature

A number of limitations were identified in the quality of the published literature that has examined the effectiveness of interventions to prevent suicidal behaviour among young people. Many studies have been unable to exclude chance, bias or confounding as alternative explanations for their findings. A significant amount of the research that has examined the recognition or assessment of suicide risk in young people has been based solely on expert opinion.
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DEFINITIONS

Youth/young person/adolescent
A person between the ages of 15-24 (inclusive) - which is the World Health Organisation definition (Health Information Service 1996). This review also considers children although it is recognised that suicide by people under 15 years of age is rare in New Zealand.

Suicide
In New Zealand the determination of death by suicide is based on a coroner’s verdict. The overseas-based literature has often used a definition that includes any death that is the direct or indirect result of a positive or negative act accomplished by the victim, knowing or believing the act will produce this result (Diekstra and Garnefski 1995).

Parasuicide or suicide attempt
This covers behaviours that can vary from suicidal gestures to serious attempts to kill oneself. It refers to any deliberate act with a non-fatal outcome that might cause or actually causes self harm, or that without intervention from others would have done so, or that consists of ingesting a substance in excess of its generally recognised or prescribed therapeutic dose (Diekstra and Garnefski 1995). Some authors have viewed parasuicide as a subset of attempts defined as being an unsuccessful suicide attempt that was (usually) of low lethality (Garrison et al. 1991b).

Suicidal ideation
Refers to cognitions that vary from fleeting thoughts that life is not worth living to very concrete well thought out plans for killing oneself. An extreme form of suicidal ideation is when a person is suffering from an intense delusional pre-occupation with self-destruction (Diekstra and Garnefski 1995).
Introduction

Suicide rates among young people in New Zealand are high by international comparison (New Zealand Health Information Service 1997a). In common with other countries around the world, youth suicide rates in this country have been increasing over the last three decades (New Zealand Health Information Service 1997a; Allebeck et al. 1996).

There has been a dramatic increase in the amount of published research into the risk factors, for suicide among young people both in this country and overseas. The amount of research addressing the identification and management of young people at high-risk of suicide has also increased. Coupled with this research interest there has also been a growing attention to the need to prevent suicide in this country by a large number of governmental and professional organisations. Particular attention has focused on the ability of health professionals in primary care with regard to their gatekeeping role in determining access to specialist treatment services. A number of groups have specifically called for the improved recognition and management of suicidal young people (and those with any mental illness) by primary care practitioners in New Zealand (Disley and Coggan 1996a; Mental Health Foundation 1995).

The patient groups included in the research and the countries in which the research have been based have been highly variable. Although only two studies were based in New Zealand, they have included the largest case control study of serious suicide attempts that has ever been undertaken among young people (Beautrais et al. 1996b), and one of the most comprehensive longitudinal studies of this topic (Fergusson and Lynskey 1995b). Together this research places New Zealand in the advantaged position of having available a considerable wealth of information about the determinants of youth suicide in this country.

NZHTA was commissioned by the Royal College of General Practitioners to undertake this literature review to assist the College with the development of guidelines for primary care professionals to prevent suicide among young people.

The review presents a synthesis of the available research and is concerned with the need to describe the methodology of the studies as well as the results of the research. The intention therefore is to give the reader an insight into current evidence on the prevention of suicide and the validity of this evidence.

The report is divided into two parts. The first part examines the epidemiology of youth suicide in Section A, while Section B considers the risk factors for suicidal behaviour among young people. Part two is concerned with the assessment (Section C), management (Section D) and treatment (Section E) of suicidal young people.
Methodology

LITERATURE SEARCH

The list of sources searched and the strategies used are given below. All searches were limited to material in English from the last ten years.

SOURCES SEARCHED

Bibliographic databases
- Medline
- Embase
- Cinahl
- Healthstar
- Clinpsych
- Psychlit
- Current Contents

Other databases
- Cochrane Library
- Database of Abstracts of Review of Effectiveness (DARE)
- NHS Economic Evaluation Database
- Best Evidence

Websites
- TRIP (Turning Research Into Practice)
- IDEA (Internet Database of Evidence-based Abstracts and Articles)
- Clinweb
- ARIF (Aggressive Research Intelligence Foundation)
- National Institute of Health (USA)
- Centre for Disease Control (USA)
- New Zealand Ministry of Health
- Canadian Medical Association

Library Catalogues
- New Zealand university and medical libraries
- Buckinghamshire Health Authority Library
- Oxford Regional Catalogue
- North Thames Region Union Catalogue

Other
- NZBN (New Zealand Bibliographic Network)
- INAHTA (International Network of Agencies for Health Technology Assessment) reports
- NZHTA in-house collection
- Personal collection of Dr A Beautrais
- Reference lists of publications obtained during the course of the project

Strategies

The various strategies that were used to search the selected databases for the relevant literature are presented in Appendix 2.

APPRAISAL METHODOLOGY

General

This review has attempted to provide an overview of the content of the literature addressing suicide prevention in primary care. The information from the literature has been presented along with a description of the validity of the evidence in relation to the way the studies were designed and undertaken.

Inclusion

This report has included an assessment of information that has been derived from research that has used a number of different study designs. These study designs have included (with the appropriate identification) opinion articles, descriptive studies, review articles, case control studies, cohort studies, controlled trials, randomised-controlled trials and meta-analyses.

This review has adopted broad inclusion criteria with regard to the literature that has been considered for appraisal. The following criteria were applied to exclude articles from appraisal:
- participation rate <50%
- sample size <20
- studies with discrepancies in their descriptions of methods/results
- studies that did not clearly describe their methods/results
- letters
- non-English language articles
- interloan articles from either within, or outside, of New Zealand that did not arrive within the time allocated for the review of the literature.

The abstracts of over 3,000 articles were reviewed from the search and from this group 300 articles were formally appraised. Articles were formally appraised using the schedule developed by the Group Health Cooperative of Puget Sound and adapted by the New Zealand Guidelines Group of the National Health Committee. A single reviewer conducted the appraisal. Summaries of appraisal results have usually been shown in table form and conclusions have been drawn that were dependent on the study design and the specific strengths and weaknesses associated with the individual studies.
Levels of evidence

Evidence grades have been applied to all of the literature based upon the study design of each article. The formal critical appraisal process systematically reviewed the methods and analysis of the studies in each of the five grades.

The level of evidence was graded using an adapted version of the US Preventive Services Task Force protocol (US Preventive Services Taskforce 1989). Thus levels of evidence were:

I  evidence obtained from at least one meta-analysis

II-1  evidence obtained from at least one randomised controlled trial.

II-2  evidence obtained from at least one controlled trial without randomisation

III-1  evidence obtained from at least one cohort analytical study, preferably based in more than one centre or research group

III-2  evidence obtained from at least one case control analytical study, preferably based in more than one centre or research group

IV  evidence obtained from at least one study that has used a primarily descriptive study design such as a cross sectional, ecological or time series methodology

V  opinions of respected authorities based on clinical experience, or reports of expert committees.

Limitations of this Review

This study has used a structured approach to review the literature. However, there are some potential limitations inherent in this process.

Although, in general, grade one evidence (randomised controlled trials and meta analyses) is usually best able to reduce the effects of bias and confounding (through the use of randomisation) the most important determinant of the validity of a study is the rigour applied to its design and subsequent analysis and not necessarily the type of study design that has been used. In addition, certain types of study are more appropriate for particular issues. For example, a cohort study can usually best describe the prognosis of a group of patients with a particular illness and a randomised-controlled trial is well suited to evaluate the effects of a treatment. The reader is referred to the original study for full clarification of the methods and results used in any particular study.

This review has been limited by the need to restrict the analysis to English language studies and references presented in the databases cited above. All web sites on the Internet could not be assessed.

Although this review has greatly benefited from advice provided by consultant, it has not been exposed to wide peer review. In addition, this review was undertaken within a very short timeframe (approximately six weeks during May-June 1998) and consequently not all of the articles that were identified from the literature search were available within time to be formally appraised. In addition, this work was mainly based upon the published academic literature and has not extensively reviewed unpublished work, or ‘grey’ literature reports (including governmental or Health Funding Authority reports).

Many of the studies included in this review were conducted outside of New Zealand; therefore it is uncertain whether their conclusions can be generalised to a New Zealand population and context.
PART 1

Section A

The epidemiology of youth suicide and the risk factors for suicidal behaviour among young people

OVERVIEW

This review presents the important epidemiological trends for suicidal behaviour among young people in New Zealand. An appreciation of these trends is important in any assessment of the risk factors for suicidal behaviour and the subsequent identification in the clinical setting of those young people who are most at risk of this behaviour. Epidemiological information is presented to describe the prevalence of suicide, attempted suicide and suicidal ideation among young people. In this review completed suicide, attempted suicide and frequent suicidal ideation are generally considered to belong on a continuum of suicidal behaviour. Although there may be some overlap between youth who self harm and those young people who express some suicidal behaviour this review does not consider the topic of self harm among adolescents.

CONCEPTUAL MODEL OF SUICIDE RISK

There have been a number of perspectives on the risk factors for suicidal behaviour among young people. Two main models of suicide risk have emerged from a review of the literature. The first model considers that risk is largely confined to young people with recognisable mental disorders, and draws support from the high rate of mental illness found in numerous case control studies e.g. Brent et al. (1994b) and the strong association between suicidal behaviour and mental disorders noted in the Christchurch-based cohort study (Fergusson and Lynskey 1995b). Other authors have conversely hypothesised that suicide is a response to overwhelming and untenable life stress that could happen to any adolescent, and psychopathology is not the most important variable e.g. Garland et al. (1989), Rubenstein et al. (1989a), Rich et al. (1988). Against this viewpoint is the consistent finding of a strong association between psychopathology and suicidal behaviour and the negative findings from several studies that have specifically examined the relationship between stress and suicidal behaviour e.g. Fremouw et al. (1993).

The two models of suicide risk are important in that they each prescribe widely diverse interventions to reduce the rate of suicide among young people. The stress model demands that population-based programmes should be delivered (often within schools) to better equip all young people with techniques to cope with stress (Garland et al. 1989), while government should provide more employment opportunities for young people (Hassal 1997). By contrast the mental illness model calls for the strengthening of health services (Beautrais et al. 1988) and generally suggests that suicide preventive services would be more effective if they were targeted at young people with psychiatric morbidity (Beautrais et al. 1998a). This review has adopted a biopsychosocial model that accommodates both of these main theories of the development of suicidal behaviour. This review has classified the risk factors for suicidal behaviour among young people into six broad domains of factors after Beautrais (1996). These six domains are (Beautrais 1996):

1. Demographic and social factors, which provide social contextual factors which, may influence both an individual’s predisposition to suicidal behaviours and to the expression of these behaviours.

2. Family characteristics and childhood experiences, including impaired child-parent relationships, exposure to physical or sexual abuse, and family dysfunction, which may influence an individual’s longer term vulnerability to psychiatric disorder and suicidal behaviour.

3. Personality factors and cognitive style (including sexual orientation), which may reflect individual variations in temperamental or related factors which may act to encourage the development of suicidal behaviours.

4. Genetic and biological factors, which may influence individual vulnerability to psychiatric disorder and risk of suicidal behaviour.

5. Psychiatric morbidity, notably affective disorders which are frequently precursors of suicidal behaviours.

6. Environmental factors, including stressful and adverse life events or the provision of models of suicide, which may play the role of precipitating suicidal behaviours or of encouraging the expression of these behaviours.

This review examines suicidal behaviour in the context of a biopsychosocial model that considers an individual’s risk of suicide results from a large number of factors which reflect biologic and genetic influences, social, family and environmental influences.
and individual personality and psychiatric illness factors (Beautrais 1996). This model suggests that the development and expression of suicide risk is the result of a complex interplay between six interrelated domains of factors (See Figure 1). The main corollary of this model is that attempts to prevent suicidal behaviour among young people can be based on interventions that are designed to reduce the influence of any of these six domains of factors either separately or in combination.
Figure 1. Conceptual model of domains of risk factors for suicide attempts

The epidemiology of suicide, attempted suicide and suicidal ideation

Information in this section unless, otherwise stated, has been derived from the following sources: (New Zealand Health Information Service 1997b; Ministry of Health 1998; New Zealand Health Information Service 1997a; Ellis and Collings 1997).

GENERAL TRENDS IN THE INCIDENCE OF YOUTH SUICIDE

During the period 1981-1989 the annual number of youth suicides increased dramatically in New Zealand from 60 deaths in 1981 to 131 deaths in 1989. Between 1990-1993 the annual number of deaths has remained relatively stable (between 125-137). Provisional figures for 1994-1996 indicate that the number of young suicide victims has slightly increased (1994-1996). The rate of suicide among youth in New Zealand has markedly increased between 1985 to 1996 from 12.6 cases per 100,000 in 1985 to 26.9 cases per 100,000 in 1996.

A review of suicide rates in New Zealand by age group found that much of the increase in suicide rates in the 1980s and early 1990s was due to a disproportionate rise in suicide for young people, especially men (Deavoll et al. 1993).

GENDER

While male deaths continue to outnumber those among females, the number of female deaths has increased over the last three years (from 16 in 1993 to 38 in 1996). Consequently, the ratio of male to female deaths has decreased from nearly 7:1 in 1991 to approximately 3:1 by 1996. Despite this trend the rate of suicide still remains significantly higher for males than females (19.6 per 100,000 in 1985 and 39.5 per 100,000 in 1996 for males compared to 5.1 per 100,000 in 1985 and 12.6 per 100,000 in 1996 for females). Conversely the rate of attempted suicide is consistently higher for females at each age group compared to males.

AGE

Young, male, suicide victims in New Zealand continue to be primarily aged between 20-24 years (the age specific rate in 1996 for 20-24 year old males is 49.7 per 100,000). By contrast, the age distribution of female deaths among the young has changed between 1991-1995. In 1991, only 25% of female suicide victims under 25 years of age were in the 15-19 year old age range whereas the proportion in this age group had increased to nearly 40% by 1995. By 1996, the suicide rate among females in the 15-19 age group (16.2 per 100,000) was higher than the rate for females aged 20-24 (12.4 per 100,000).

The male suicide rate in each age bracket remains higher than the corresponding rate for females.

Although youth have the highest age specific death rates for suicide it should be remembered that most suicides (approximately two thirds) in New Zealand occur among people over the age of 24 years (Coggan 1997).

Death by suicide before 15 years of age continues to be extremely rare in New Zealand (on average between 0-4 cases per annum between 1991-1996).

ETHNICITY

Maori rates of suicide before 1995 have been generally lower than non-Maori. However, by the early 1990s the suicide rate for Maori was similar to non-Maori (Skegg et al. 1995). This change was primarily due to a sharp increase in suicide rates among young Maori (especially those aged 15-24 years) between 1987-1991 (Skegg et al. 1995). Langford et al. (1998) has argued that the rising suicide rates among young Maori is a reflection of an increasingly decultured, colonised and detribalised group who have lost their traditional cultural supports.

In 1995 the method used for recording ethnicity for all mortality data changed from a system that was based on a biological definition of ethnicity (i.e. 50% or more ancestry) to one that determined ethnicity by self-identification. This method is compatible with the data used for the denominator in the calculation of population rates, namely that obtained by the census. This change in the method of recording mortality information means that it is not possible to accurately compare data from 1995 and earlier with that obtained in 1996 and subsequent years.

---

1 The number of youth suicide victims is the actual number of people who have died by suicide.
2 The rate of youth suicide is the frequency with which suicide occurs relative to the total number of people in the defined population (people aged 15-24 years).
In contrast to previous years the rate of suicide in 1996 among Maori youth was higher than that of non-Maori (38.4 per 100,000 for Maori compared to 24.3 per 100,000 for non-Maori). It is likely that the reversal in suicide rates between Maori and non-Maori before and after 1995 is related to the change in the method of collecting ethnicity data.

Suicide among young Pacific Islanders appears to be uncommon, in 1996 four Pacific Island youths died by suicide.

**METHODS OF YOUTH SUICIDE**

The most frequently reported method of suicide used by both males and females in 1995 was hanging (56% of deaths for males and 65% for females). The proportion of deaths by hanging has markedly increased among females between 1991-1995 (from 12.5% to 65%). Much of the increase in female suicides between 1991-1996 has been attributed to an increase in the number of deaths by hanging.

**INTERNATIONAL COMPARISONS**

Rates of suicide among young people are high in New Zealand by international comparison. In 1995, New Zealand had the highest rate of suicide among young women amongst all the OECD countries, and the second highest rate of suicide among males aged under 25 years (44.1 per 100,000 in New Zealand compared to 45.4 per 100,000 for Finland). New Zealand and Australia are the only OECD countries in which youth suicide rates are higher than the average suicide rate for the entire population (Pritchard 1992b).

There has been a consistent trend of rising youth suicide rates (especially among males) over the last 20 years among the OECD countries. England and Wales have recorded an increase in youth suicide rates between 1960-1990 (McClure 1994). In the United States, youth suicide rates have doubled between 1950 and 1993 (Singh and Yu 1996; Bingham et al. 1994). In Australia rates of suicide have increased between 1960-1990 (Krupinski et al. 1994). A similar trend of increasing youth suicide rates, predominantly among young males, has also been noted in Canada (Reed et al. 1985) and several European countries (Diekstra 1993).

Recent figures suggest that the suicide rate in several countries, including New Zealand may be plateauuing or even beginning to decline (Ministry of Health, 1998; Allebeck et al. 1996; New Zealand Health Information Service 1997b).

**EXPLANATIONS FOR THE GLOBAL RISE IN YOUTH SUICIDE**

There is no clear explanation of why youth suicide rates are increasing. While the results from some studies have indicated that mental illness rates (especially major episodes of depression) among young people may have been increasing (Joyce et al. 1990), other studies have not found any such increase (Der et al. 1990; Lehtinen et al. 1991). Two population-based, time series studies both consistently found that an increase in the rate of youth suicide was strongly correlated with rises in unemployment along with some other environmental factors (Morrell et al. 1993; Pritchard 1992a). However, time series analysis has a limited ability to exclude other confounding explanations for these associations.
Table 1. Prevalence of suicidal behaviour

<table>
<thead>
<tr>
<th>Author</th>
<th>Sample</th>
<th>Study design</th>
<th>Level of evidence</th>
<th>Conclusions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Lifetime prevalence - studies with random, community samples</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Velez and Cohen 1988) United States</td>
<td>Random population-based survey of 752, 9-18 year olds</td>
<td>Cross sectional</td>
<td>IV</td>
<td>3.5% had ever attempted suicide by age 18 (73% had not received medical attention) (95% CI 3.29-3.71)</td>
</tr>
<tr>
<td>(Fergusson and Lynskey 1995b) New Zealand</td>
<td>954 members of a representative birth cohort at 16 years of age in Christchurch (NZ)</td>
<td>Cohort</td>
<td>III-1</td>
<td>3% had attempted suicide by age 16 years (95% CI 2.84-3.16)</td>
</tr>
<tr>
<td>(Reinherz et al. 1995) United States</td>
<td>400 18 year olds in randomly selected cohort followed up since age of 5 years</td>
<td>Cohort</td>
<td>III-1</td>
<td>4% had ever attempted suicide by age 18 years (95% CI 3.66-4.34)</td>
</tr>
<tr>
<td><strong>Lifetime prevalence - large school-based surveys (n&gt;1300)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Shaffer et al. 1990b United States)</td>
<td>1,438 high school students</td>
<td>Cross sectional</td>
<td>IV</td>
<td>6.3% by age 16 years (95% CI 6-6.59)</td>
</tr>
<tr>
<td>(Dubow et al. 1989 United States)</td>
<td>1,384 high school students</td>
<td>Cross sectional</td>
<td>IV</td>
<td>7% by age 18 years (95% CI 6.64-7.34)</td>
</tr>
<tr>
<td>(Andrews and Lewinsohn 1992 United States)</td>
<td>1,710 young adults in Oregon</td>
<td>Nested case control</td>
<td>III-1-2</td>
<td>7.1% of young people had ever attempted suicide (95% CI 6.79-7.41)</td>
</tr>
<tr>
<td><strong>Period prevalence - last 12 months based on large surveys (n&gt;1300)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Patton et al. 1997 Australia)</td>
<td>1,699 16 year olds</td>
<td>Cohort</td>
<td>III-1</td>
<td>0.2% had attempted suicide within last 12 months (95% CI 0.18-0.22)</td>
</tr>
<tr>
<td>(Felts et al. 1992 United States)</td>
<td>2,890 North Carolina high school students</td>
<td>Cross sectional</td>
<td>IV</td>
<td>4.5% had attempted suicide in last 12 months (95% CI 4.43-4.57)</td>
</tr>
<tr>
<td>(Garrison et al. 1993 United States)</td>
<td>3,764 high school students in South Carolina</td>
<td>Cross sectional</td>
<td>IV</td>
<td>7.5% had attempted suicide within last 12 month (80% did not receive medical care) (95% CI 7.28-7.77)</td>
</tr>
<tr>
<td>(Garrison et al. 1991a United States)</td>
<td>1,542 12–17 year olds in schools in Southeastern cities</td>
<td>Cross sectional</td>
<td>IV</td>
<td>1.7% had attempted suicide in last 12 months (95% CI 1.65-1.75)</td>
</tr>
</tbody>
</table>

(All confidence intervals calculated according to the formula presented in Kahn and Sempos, 1989 and assuming dichotomous data).

3 Some students were then excluded based on the consistency of the results in a second questionnaire.
The incidence or prevalence of suicide attempts in the population has been estimated by the number of hospital admissions in a community and by specific surveys.

In 1996, 751 females (rate of 282 per 100,000) and 437 males (rate of 163 per 100,000) hospitalisations were made for attempted suicide in New Zealand (Ministry of Health 1998). The age specific hospitalisation rate for attempted suicide is highest among males in the 20-24 year old age group, while the rate for females is highest for 15-19 year olds (Coggan et al. 1997).

Consistent with the increase in the number of completed suicides by youth between 1960 and 1990, hospitalisations for attempted suicide have also increased in New Zealand and most other OECD countries (Diekstra 1982; 1993).

Estimates of attempted suicide that are based on only hospital data are likely to underestimate the true incidence of suicide attempts as many may not result in the person receiving medical attention. Evidence that hospitalisation data presents only the ‘tip of the iceberg’ comes from several population-based surveys that have specifically surveyed young people about their history of suicide attempts and whether they subsequently sought medical attention (Velez and Cohen 1988; Garrison et al. 1993; Centre for Disease Control 1991). Typically, these cross sectional studies have found that only about 1 in 4 adolescents who have made a suicide attempt ever obtained any medical care.

The best estimates of the lifetime prevalence of suicidal attempts by young people come from studies that have included a random, population-based sample. Only three studies were found that have assessed the lifetime prevalence of suicidal attempts using such a sample (Velez and Cohen 1988; Fergusson and Lynskey 1995b; Reinherz et al. 1995). These three studies (including one based in New Zealand), despite the variation in the age at which the information was obtained and some differences in the definition of a suicide attempt, consistently found that approximately 3.5% of all adolescents had attempted suicide. Supportive evidence for the conclusion that around 3% of people aged between 16-18 years would have previously attempted suicide at least once in their lifetime comes from four large school-based surveys conducted in the United States. These surveys were carried out among students while they were at school and it is possible that these adolescents would be less likely than young people who were no longer attending high school to have ever attempted suicide. Nevertheless these studies are informative because of their large size and because they interviewed a random sample of school students. These studies found that a higher percentage of students reported that they had made at least one suicide attempt (around 7%). At least part of the explanation for the higher lifetime prevalence of suicide attempts among school-based samples may relate to the lower response rates in these surveys compared to those that had used a community sample (approx 45% compared to 80%). It is possible that the students, who responded to the questionnaire, may have been more likely to have a history of suicidal behaviour. Another issue is that these studies employed questionnaires instead of interviews to gather their data. The relative reliability of either method of information gathering among young people is not known, and it is possible that students may either over-report, or alternatively, more accurately state their actual history of suicidal behaviour when a questionnaire is used to collect the data.

By contrast, estimates of the lifetime prevalence of a suicide attempt that have been undertaken on small and highly selected populations in different school settings have exhibited considerable variation in their results. Kienhorst et al. (1991a) found that only 2.2% of adolescents had ever attempted suicide, whereas Rubenstein et al. (1989b) estimated that the lifetime prevalence was 20% in another group of high school students. Some of the difference in the results obtained by these studies might also be due to the small sample sizes that have been used in these analyses (300 and 66 students in Kienhorst and Rubenstein, respectively).

Several studies have found that although male youths have higher rates of completed suicide, females are more likely to attempt suicide (See Table 2).

Considerable variation exists in the reported prevalence of suicidal attempts in the preceding 12 months (0.2%-7.5%). Some of this variation may be due to differences in the definition of suicidal behaviour that has been employed by the respective studies. The highest estimates have been found in the studies that have used a broad definition of a suicide attempt (‘taking any action that may end your life’ (Garrison et al. 1993)). By contrast those studies that have used a more stringent definition requiring an intention to die along with a high lethality method for inclusion e.g. Patton et al. (1997) have found significantly lower estimates.
Table 2.  Lifetime prevalence by sex of a suicide attempt derived from community based cross sectional studies

<table>
<thead>
<tr>
<th>Author</th>
<th>Study design</th>
<th>Level of evidence</th>
<th>Lifetime prevalence of male suicide attempt (%)</th>
<th>Lifetime prevalence of female suicide attempt (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Velez and Cohen 1988)</td>
<td>Cross sectional</td>
<td>IV</td>
<td>2.1 (95% CI 1.74-2.46)</td>
<td>4.8 (95% CI 3.29-6.31)</td>
</tr>
<tr>
<td>(Joffe 1988)</td>
<td>Cross sectional</td>
<td>IV</td>
<td>2.4</td>
<td>7.1</td>
</tr>
<tr>
<td>(Andrews and Lewinsohn 1992)</td>
<td>Cross sectional</td>
<td>IV</td>
<td>3.8 (95% CI 3.46-4.34)</td>
<td>10.1 (95% CI 8.38-11.82)</td>
</tr>
</tbody>
</table>

(All confidence intervals calculated according to the formula presented in Kahn and Sembros, 1989 and assuming dichotomous data).
Epidemiology of suicidal indicators

Several community based cohort and cross sectional studies have examined the lifetime prevalence of severe suicidal ideation using representative samples of patients based in several countries (See Table 2). A New Zealand study reported that 12% of a birth cohort by 16 years of age had experienced serious suicidal ideation (Fergusson and Lynskey 1995b). This study was well conducted and losses to follow-up were modest and did not appear to have any systematic differences from those for whom data was available. However, no information was included on the cause of death (especially whether it was suicide) for the small number of the cohort who had died. The study found that 12% of young people by the age of 16 years had seriously contemplated suicide. This estimate is lower than that from other studies that have used similar robust methodologies (range = 22%-33%), although it should be noted that most of these studies were based on an older age group (See Table 2). It is reasonable to expect that the cumulative total of adolescents who have experienced suicidal ideation should be higher with age. At least part of the variation in the prevalence of suicidal ideation is also due to differences in the definition of suicidal ideation that have been used in the different studies. The results presented in the study by Velez and Cohen (1988) clearly illustrate this point. When suicidal ideation was defined as subjects endorsing any statement that expressed a wish to die, 26% of the sample were considered to have experienced suicidal ideation. However, when more stringent criteria were used (at least three affirmative answers on the questionnaire that indicated a wish to kill oneself) then the lifetime prevalence was only 6%.

Finally, Fergusson and Lynskey (1995b) considered it was likely that significant under-reporting may have occurred in the responses to their study. Most of the other studies have also referred to the difficulties in gaining accurate and reliable information on the past thoughts of adolescents, especially in relation to suicidal ideation.

Other articles subject to significant methodological deficiencies have reported a wide range in the lifetime prevalence of suicidal ideation (between 6%-63% (Garrison et al. 1991a; Garrison et al. 1993; Lewinson et al. 1994a; Smith and Crawford 1986). The wide variation in these results can largely be attributed to the highly selected study populations.

Surveys of the point prevalence of suicidal ideation among young people have generally produced highly variable results, largely in relation to significant limitations associated with the research. Studies based on highly selected groups of young university students have reported that over 35% of subjects had experienced serious suicidal ideation over the preceding year (Rudd 1989; Schweitzer et al. 1995; Dubow et al. 1989). By contrast, other surveys of high school students have found that less than 14% of young people had considered suicide within the last 12 months (Kashani et al. 1989; Goldney et al. 1989).

LONGITUDINALLY WHAT HAPPENS TO PEOPLE WHO HAVE ATTEMPTED SUICIDE OR HAVE EXPERIENCED SUICIDAL IDEATION?

While suicidal ideation among young people appears common in the community, there is some evidence that persistent suicidal ideation may be related to subsequent suicidal attempts or death by suicide (Martunen et al. 1992; Lewinsohn et al. 1994b; Pfeffer et al. 1991; Granboulan et al. 1995). The presence of an underlying mental illness was identified as a common factor present among young people with persistent suicidal ideation and among those who subsequently made a suicide attempt after 18 months of follow-up (Buddeberg et al. 1996).

Few studies published between 1988-1998 have longitudinally examined the outcome for adolescent suicide attempters. Notable exceptions are (Granboulan et al. 1995; Kerfoot and McHugh 1992; Kotila and Lonnqvist 1989a). These studies have consistently found that patients who have attempted suicide are at high-risk of subsequent death by suicide. Approximately 0.5-1% will die each year by suicide. Unfortunately these studies have been characterised by several significant limitations. The studies were based on a small number of patients, all had high losses to follow-up e.g. Granboulan et al. (1995) 52% lost to follow-up, Kerfoot and McHugh (1992) 69% were untraceable after 7 years and their retrospective analyses cannot exclude bias as an explanation for their findings. The high level of attrition from follow-up is especially significant because it is likely that patients defaulting from follow-up may be more likely to experience a poor outcome.

It should be noted that the results presented in Table 4 were based on groups of patients who had initially been recruited into a study after they had been admitted to a general hospital. It is unclear if the findings from these studies can be generalised to patients who have attempted suicide but who were not admitted to hospital.
In other studies undertaken between 1988-1998 that have been based on adult suicide attempters, approximately 1% of suicide attempters will die within the first year of their attempt as a result of a subsequent successful event (Hawton and Flagg 1988). Other studies with follow-up periods of 5-10 years have also found that between 0.5%-1% of patients subsequently kill themselves each year (Johnsson Fridell et al. 1996; Cullberg et al. 1988; Nielson et al. 1990). In addition, unsuccessful suicide attempts are also common. (Johnsson Fridell et al. 1996) found that 40% of patients had undertaken at least one further attempt over a five-year follow-up period.

SUMMARY

- Most young people in New Zealand commit suicide by hanging.
- Approximately three times more young people are hospitalised for attempted suicide than complete suicide each year, and approximately four times more young people will attempt suicide but never receive medical care.
- Attempted suicide is more common among females although death rates are higher for males.
- The suicide rate among young Maori has been lower than non-Maori, although recent data suggests that these rates may be converging.
- From the results of community-based studies, approximately 3.5% of people will have attempted suicide by age 18 years (school-based surveys have recorded a higher number).
- The results of community-based studies suggest that up to 30% of young people will have experienced severe suicidal ideation by 18 years of age.
- In overseas based studies young people with persistent and severe suicidal ideation have been found to be at high-risk of making a suicide attempt, and those people who have attempted suicide have been found to be at an increased risk of later suicidal death.

- In New Zealand the number, and rate, of suicidal deaths among young people has been increasing over the last two decades.
- Approximately one third of all suicide victims in New Zealand are aged between 15-24 years. Young males between 20-24 years have the highest age-specific suicide rates.
- New Zealand suicide rates are high by international comparison.
Table 3. Lifetime prevalence of suicidal ideation

<table>
<thead>
<tr>
<th>Author</th>
<th>Sample</th>
<th>Study design</th>
<th>Level of evidence</th>
<th>Lifetime prevalence of suicidal ideation (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Fergusson and Lynskey 1995b)</td>
<td>New Zealand 954 members of a birth cohort at 16 years of age in Christchurch</td>
<td>Cohort study</td>
<td>III-1</td>
<td>15% up to 16 years of age (95% CI 13.64-16.36)</td>
</tr>
<tr>
<td>(Reinherz et al. 1995)</td>
<td>Cohort of 400 in US followed up since 5 years of age</td>
<td>Cohort study</td>
<td>III-1</td>
<td>22.5% by age 15 years (95% CI 20.11-24.89)</td>
</tr>
<tr>
<td>(Velez and Cohen 1988)</td>
<td>United States Random census based survey of 752 US 9-18 year olds</td>
<td>Cross sectional</td>
<td>IV</td>
<td>26% at 18 years (95% CI 24.18-27.82)</td>
</tr>
<tr>
<td>(Felts et al. 1992)</td>
<td>United States Sample of 2,890 North Carolina (US) high school students</td>
<td>Cross sectional</td>
<td>IV</td>
<td>33% by age 17 years (95% CI 31.98-34.02)</td>
</tr>
<tr>
<td>(Andrews and Lewinsohn 1992)</td>
<td>United States Community sample of 1,710 young adults in Oregon</td>
<td>Nested case control</td>
<td>III-1-2</td>
<td>21.1% by age 16 years (95% CI 20.01-22.19)</td>
</tr>
</tbody>
</table>

(All confidence intervals calculated according to the formula presented in Kahn and Semos, 1989 and assuming dichotomous data).

Table 4. Longitudinal studies investigating the outcome of suicidal attempters

<table>
<thead>
<tr>
<th>Author</th>
<th>Study population and design</th>
<th>Further attempts</th>
<th>Further deaths by suicide</th>
<th>Other outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Granboulan et al. 1995)</td>
<td>France 265 adolescents followed over 9 years</td>
<td>31% of traceable patients had repeated a suicide attempt</td>
<td>5.6%-11.8% over 10 years (Inadequate information to make exact result)</td>
<td>33% of traceable patients had progressively worse scores on scales of psychosocial functioning</td>
</tr>
<tr>
<td>(Kerfoot and McHugh 1992)</td>
<td>UK 100 adolescents followed over 7 years</td>
<td>20% had made further suicide attempt(s)</td>
<td>0</td>
<td>Poor psychosocial outcome, high rates of unemployment, criminal convictions (50%) etc.</td>
</tr>
<tr>
<td>(Kotila and Loninquist 1989a)</td>
<td>Finland 362 adolescents hospitalised</td>
<td>Not considered</td>
<td>3.6% within 5 years</td>
<td>Not considered</td>
</tr>
</tbody>
</table>

(no p values descritive data)
Risk factors for suicidal behaviour

The risk factors for suicidal behaviour among youth are multifactorial, complex and probably inter-related (Beautrais et al. 1996b). Several broad domains of factors have emerged in reviews examining the risk factors for youth suicide (Beautrais 1998; Blumenthal 1990b; Shaffer 1988). This review examines the risk factors for suicidal behaviour among youth under six general domains of factors: social/demographic risk factors, family characteristics and childhood experiences, personality traits/disorders and cognitive style, genetic/biological risk factors, psychiatric risk factors, and life events or stresses.

**DOMAIN 1: SOCIAL AND DEMOGRAPHIC RISK FACTORS**

Young people at highest risk of suicide, or attempted suicide, are characterised by their low socioeconomic status and poor educational backgrounds (See Table 5).

Although studies examining the relationship between socioeconomic status (SES) and educational background have not all consistently found that low SES and poor educational achievement have been associated with an increased risk of suicidal behaviour among young people e.g. Pelkonen et al. (1997), relatively strong evidence of the association between these variables comes from several studies that have employed a prospective study design e.g. Fergusson and Lynskey (1995a) and have been well conducted e.g. Beautrais et al. (1996b), Fergusson and Lynskey (1995a) or were based on a large sample size (Allebeck and Allgulander 1990).

**DOMAIN 2: FAMILY CHARACTERISTICS/CHILDHOOD BACKGROUND**

A large number of studies have found that young people with suicidal behaviours come from family backgrounds characterised by dysfunctional or difficult circumstances. Strong and consistent associations have been found between suicidal behaviour and parental psychopathology (See Table 6), poor inter-familial communication (See Table 8) and parental separation (See Table 7).

Parental psychopathology

A strong association has been found between parental psychopathology (especially parental substance abuse, affective disorders, antisocial behaviours, a familial history of suicide) and an increased risk of suicidal behaviour among young people in a number of trials with a variety of study designs, and based in a number of countries e.g. Brent et al. (1996), Gould et al. (1996), Fergusson and Lynskey (1995a). However, it should be noted that although an increased familial aggregation of suicide and psychiatric illness has been demonstrated by these studies and familial transmission inferred this cannot be definitively concluded from these studies. The demonstration of this would require a more powerful study design than those presented here, for example, large prospective twin studies or adoption studies. Familial transmission might involve environmental factors such as a life-long exposure to violence, poor intra-familial relationships and dysfunctional communication. Large, prospective twin studies would be best able to elucidate the relative effects of genetic and environmental influences on suicidal behaviour. However, the time required conducting these studies does make them problematic to undertake.

Parental loss

Most studies have consistently found that parental loss (usually by separation or divorce) was significantly associated with suicidal behaviour among young people (See Table 7). Parental discord has also been associated with youth suicide (De Wilde et al. 1992).

Poor parental care/relationship with children (not including overt abuse), poor family communication

Although most studies have reported that impaired parent-child relationships have been associated with suicidal behaviour among young people (See Table 8) one cohort study failed to find any relationship between the variables (Allebeck and Allgulander 1990). At least in part this inconsistency may relate to the different ways that parent child relationships have been assessed by various studies e.g. in Allebeck and Allgulander (1990) and the parental bonding index in the study by Martin and Waite (1994). It is notable that studies that have used the same method of measuring the quality of the parent-child relationship have consistently identified that poor parental care was a factor that increased the risk of suicidal behaviour among young people e.g. parental bonding index and the studies by Martin and

Physical/sexual abuse

A large number of studies have recorded an excess risk of suicidal behaviour among youths in relation to a history of past physical and/or sexual abuse (See Table 9). The study by Brent et al. (1994c) was an exception, although this study did find that past abuse was related to suicidal behaviour the association did not reach statistical significance perhaps due to an inadequate sample size.

Studies in selected populations that have reviewed the relationship between suicidal behaviour and sexual/physical abuse have also reported associations between these two variables in relation to homosexual or chemically dependent young people (See Table 10).

DOMAIN 3: PERSONALITY AND COGNITIVE ATTRIBUTES AND SEXUAL ORIENTATION

A number of studies have found associations between suicidal behaviour and several personality disorders or traits (See Tables 11-13). In general the evidence for an association between personality disorders and suicidal behaviour is more robust than that available for a relationship between personality traits and suicidal behaviour among young people. Studies that have examined the association between personality traits and youth suicidal behaviour have usually had small sample sizes e.g. Brent et al. (1994a) or have been unable to exclude bias as an explanation for any association e.g. Kashani et al. (1989). The evidence for an association between certain cognitive styles and suicidal behaviour among young people is even weaker (based on the finding from two relatively small case control studies- See Table 14), while there is no consistent evidence of any relationship between sexual orientation and suicidal behaviour among young people (See Table 13).

The personality disorders have included antisocial, borderline and avoidance disorders, while the traits have included impulsivity, anger and aggressiveness or withdrawal. These personality disorders have in common symptoms of intense rage and impulsive behaviour.

Sexual orientation

It has been suggested that the stigmatisation of homosexual young people is associated with an increased risk of suicide particularly among gay men (Gibson 1989). Two studies (Shaffer et al. 1995; Remafedi et al. 1991) have evaluated the risk of suicide among homosexual young people, and although one (Remafedi et al. 1991) reported very high rates of suicidal behaviour among gay youths frequenting support groups or bars, the validity of this study’s findings was limited by the lack of a community control group. Significantly, the study that included a more representative control group failed to find any increased risk of suicidal behaviour among homosexual young people (Shaffer et al. 1995).

Cognitive styles and suicidal behaviour

Cognitive styles (the way in which an individual perceives, mentally organises and understands life experiences) also appear to be related to the risk of suicidal behaviour although the relationship has been noted in a relatively small number of studies that have involved modest sample sizes (See Table 14). Tendencies to think in a relatively inflexible manner and poor problem solving ability have been related to suicidal behaviour (Rotheram-Borus et al. 1990). Finally, a negative or hopeless outlook has also been associated with suicidal behaviour (Keinhorst et al. 1992).

DOMAIN 4: BIOLOGICAL RISK FACTORS FOR SUICIDAL BEHAVIOUR AMONG YOUNG PEOPLE

There is some evidence that reduced levels of serotonergic activity exist in the brains of suicide victims and suicide attempters (Cohen et al. 1988). There is also some evidence that altered serotonin levels and impulsivity or aggression may be linked, and it has been noted that these traits are also associated with suicidal behaviour (Cohen et al. 1988). However, relatively little is known about the effects of serotonin and the relationship between the level of this compound (and its metabolites) and suicide. It is also unclear if levels of these compounds are related to the suicide behaviour or an underlying specific psychiatric disorder, especially depression (Cohen et al. 1988).

Low serum cholesterol levels have been associated with suicide but recent data has not found any association between the variables (See Table 15).

Several studies have found that suicidal behaviour is more common among young people with relatives who have exhibited suicidal behaviour (See Table 15). However, as discussed in the family characteristics domain it is unclear whether this increased risk of suicidal behaviour among the children of suicidal parents is due to a genetic or environmental cause. In
addition, it is unclear from the research whether what is being transmitted is a biological predisposition to suicide or a biological vulnerability to the psychiatric disorders with which suicide is commonly associated.

**DOMAIN 5: PSYCHIATRIC MORBIDITY AS A RISK FACTOR FOR SUICIDAL BEHAVIOUR**

Most studies of suicidal behaviour among young people have consistently reported that the majority of young people who die by suicide or make a serious attempt have a recognisable psychiatric disorder at the time of their attempt (See Table 16). Most commonly, these disorders are affective disorders, substance abuse and antisocial behaviours (See Table 16). The link between suicidal behaviour and depression is especially important because of the relatively high prevalence of depression. This link has been established from the results of numerous studies, based in a number of countries, and which have used two major study designs - prospective cohort studies and retrospective case control studies based on the psychological profiles of suicide victims (psychological autopsy studies, See Table 16).

Although relatively few young people will have a psychotic disorder (such as schizophrenia), amongst the relatively small number with these severe mental illnesses the risk of suicide is very high (Westermeyer et al. 1991).

**Co-morbid mental disorders**

There is significant evidence that there is an increased risk of suicidal behaviour among those young people with co-morbid psychiatric conditions (that is, the occurrence of more than one psychiatric condition at the same time (See Table 17). The increased risk may be directly proportional to the number of co-morbid conditions.

**DOMAIN 6: PRECIPITATING STRESSFUL EVENTS**

A significant body of research has found that suicidal behaviour is often preceded by a stressful life event especially; an interpersonal conflict, loss, or legal/disciplinary problems (See Table 18). These events may act as a precipitant for suicidal behaviour in an adolescent who often may have other underlying risk factors (Beautrais et al. 1997b; Brent et al. 1993b).

A well recognised problem with studying the relationship between life events and suicide is that either a suicide attempter’s responses (or those of a victim’s family) to questions about life events may be subject to bias. It is possible that mental illness may influence the reporting of life events among young people. In addition, it is also possible that a victim’s family may recall more preceding stressful life events prior to a suicide in order to “make sense” of a tragic death. The study by Beautrais et al. (1997b) is notable because it purposely attempted to prevent bias by checking the data gathered from suicide attempters about recent stressful life events against separate reports obtained from significant other informants.

**THE RISK FACTOR DOMAINS ARE INTERRELATED**

Although the risk factors have been presented separately they are inter-related and they operate in a complex manner over differing time periods in ways that are unique to individuals (Keinhorst et al. 1995). For example, young people who are unemployed are also more likely to have a psychiatric illness, and also more likely to have socioeconomically disadvantaged families, that also have higher rates of parental psychopathology (Fergusson et al. 1997). The conceptual model presented in the beginning of this review illustrates the complex inter-relationship that exists between these risk factor domains in both the development and the expression of suicidal behaviour among young people (See Figure 1). Stressful life events and psychiatric morbidity are closely related in this conceptual model of the development of suicidal behaviour. The closeness of this relationship is illustrated in the study by Grossman et al. (1993) which found that youth that died by suicide were more likely to have had a recent motor vehicle crash. Young people with a major psychiatric illness e.g. substance abuse were also more likely to have had a motor vehicle accident and were more likely to have committed suicide.

The findings from the study by Beautrais et al. (1996a) clearly illustrate the complex relationships that exist between the risk factor domains. Beautrais et al. (1996a) found that sociodemographic and family characteristic risk factors were related to environmental factors which were all related to the incidence of suicidal behaviour in young people. In addition, these same sociodemographic and family characteristic risk factors were related to psychiatric morbidity, which were all also related to suicidal behaviour. Finally, environmental and psychiatric risk factors were related to each other and also to the development of suicidal behaviour in young people.
THE RELATIVE IMPORTANCE OF THE DIFFERENT RISK FACTOR DOMAINS

A number of studies have estimated the relative importance of the different domains of risk factors by univariate/multivariate analyses (based on cross sectional data), and by calculating the odds ratio or relative risk for adolescents who died by suicide, or suicide attempters, who were exposed to the risk factor in relation to those other adolescents who were not. The results of these analyses have consistently found that a concurrent mental illness, and in particular the presence of co-morbid psychopathologies, are uniformly the most important risk factor (See Tables 19-21). Studies that have assessed the prevalence of diagnosable psychopathology among suicide victims by means of psychological autopsy investigations have consistently found that 80%-90% of victims had a psychiatric condition at the time of their death (See Table 19). Among these studies the presence of an affective disorder (43%-63% of victims) and substance abuse (26%-47% of victims) have been the most psychiatric diagnoses. Similarly studies that used a cohort design have also commonly found a statistically significant relationship between psychiatric morbidity and suicidal behaviour (See Table 20). The two New Zealand-based studies that have presented an estimate of the size of the association between the different risk factors and suicidal behaviour have both consistently found that the odds ratio (or relative risk) was largest between the presence of various psychiatric disorders and suicidal behaviour (See Table 21).

Although not as strong as the relationship between psychiatric morbidity and suicidal behaviour there is also consistent evidence that suicidal behaviour among young people is associated with the sociodemographic and family characteristics/childhood experiences domain of risk factors. The evidence for the relationship between suicidal behaviours among young people and the personality traits/disorders/cognitive styles/sexual orientation or biological risk factor domains is generally less convincing.

THE RELATIONSHIP BETWEEN THE PAST HISTORY OF A SUICIDE ATTEMPT AND SUICIDE

Those who die by suicide will often have made past attempts, similarly those people with suicidal ideation are at high-risk of later suicidal behaviours (See Table 22).

THE RELATIONSHIP BETWEEN SUICIDAL IDEATION AND SUICIDAL ATTEMPTS

Studies that have addressed the relationship between suicidal ideation and suicidal attempts/acts have done so by an assessment of the similarities and differences between those subjects that either have, or have not, reported these factors. In community based studies those making attempts are characterised as having a greater burden of psychosocial risk factors for suicide (higher rates of psychiatric disorders, and greater socioeconomic and familial adversity) (Dubow et al. 1989; Fergusson and Lynskey 1995b; Brent et al. 1988). For example, in the study by Brent et al. (1988) suicide attempters and ideators shared similar risk factors except that there was a higher prevalence of the major risk factors e.g. depression, substance abuse and chronic family discord) among those young people who had attempted suicide.

A model can be presented that views suicidal behaviours along a continuum, with the extent of the suicidal tendencies expressed by the individual varying in relation to their exposure to risk factors for suicidal behaviours (Keinhorst et al. 1995).

However, in clinic based studies e.g. Kosky et al. (1990), Carlson and Cantwell (1982) those adolescents who have made attempts have generally not differed from those with suicidal ideation. It may be that patients in clinic settings have generally higher levels of psychopathology, and consequently differences between the two populations (if they exist) may therefore be obscured. Alternatively, this disparity might be explained by the cross sectional study designs that have generally been used to examine the relationship between ideation and suicide attempts. A cross sectional study design is inherently unable to assess causality because the time sequence of any association cannot be ascertained. While it is possible that people with ideation are more likely to commit suicide it could also be true that those people who have attempted suicide might be more prone to ruminate about killing themselves. The only reliable method of ascertaining whether suicidal ideation is an accurate predictor of suicidal behaviour is to follow representative, population-based, samples of patients with and without suicidal ideation over a number of years to assess how many subsequently undertook suicidal behaviour. The only study that has used this type of methodology is the Christchurch-based prospective cohort study (Fergusson and Lynskey 1995b). The results of this study have been consistent with the continuum model, those young people that have reported suicidal ideation are most likely to subsequently attempt suicide when they have a greater burden of psychosocial risk fac-
tors especially psychiatric illness and a disadvantaged background.

The two most important corollaries of the continuum model are:

1. Young people most at risk of suicide can (to some extent) now be predicted. That is, in those individuals with suicidal ideation but no or few additional risk factors suicide is unlikely, and conversely, the high-risk adolescent is characterised by suicidal ideation and multiple risk factors.

2. Interventions that reduce the frequency and the effect of the underlying major risk factors will be the most effective at reducing the rate of suicide among young people.

**SUMMARY - RISK FACTORS**

Young people at highest risk of suicide are primarily characterised by:

- high rates of psychiatric illness (especially affective disorders and substance abuse) and the presence of co-morbid mental disorders.

There is also a strong association between the following risk factors and suicidal behaviour among young people:

- low socio-economic status and poor educational background
- previous suicide attempts and persistent suicidal ideation
- family backgrounds with dysfunctional or difficult circumstances, including parental pathopsychology, parental separation, poor inter-familial communication, or sexual and/or physical abuse
- environmental factors and stressful life events.

There is a weaker association between suicidal behaviour and the following risk factors:

- personality disorders, impulsive/aggressive personality traits and inflexible thinking or poor problem solving, cognitive ability
- biological factors.

All of these risk factors can be combined in a complex and inter-related model that describes the development and expression of suicidal behaviour among young people.
Table 5. Socio-demographic risk factors and youth suicide

<table>
<thead>
<tr>
<th>Author</th>
<th>Sample/setting</th>
<th>Study design</th>
<th>Level of evidence</th>
<th>Comments</th>
<th>Results/Conclusions</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Gould et al. 1996) United States</td>
<td>120 victims &lt; 20 years old</td>
<td>Case control Retrospective psychological autopsy and Community controls</td>
<td>III-2</td>
<td>Recall bias from family members possible limitation</td>
<td>Cases more likely to be lower SES (p&lt;0.001), unemployed (OR=44.1, 95%CI 4.5-432), left school earlier (OR=6.1, 95%CI 5.1-1.2-20.7)</td>
</tr>
<tr>
<td>Allebeck and Allgulander 1990 Sweden</td>
<td>50,465 army conscripts over 12 years</td>
<td>Cohort</td>
<td>III-1</td>
<td>Indicators used of low SES background e.g. truancy but questionable validity of indicators</td>
<td>Impoverished social background: Contact with police (OR=1.84, 95%CI=1.37-2.48), high parental alcohol intake (OR=2.1, 95%CI 1.25-3.52), no friends (OR=3.21, 95%CI 1.47-6.79)</td>
</tr>
<tr>
<td>(Beautrais et al. 1996b) New Zealand</td>
<td>129 cases, 153 controls Christchurch</td>
<td>Case control Population controls</td>
<td>III-2</td>
<td>Unemployment was not associated with suicide when low income and education were excluded from the model*</td>
<td>Increased socio-demographic disadvantage: Lower educational qualifications (adj OR=6.3, 95%CI 3.1-12.9, p=0.0001), lower income (adj OR=5.1, 95%CI 7.9-9.6, p=0.0001), increased residential mobility (adj OR=2.3, 95%CI 1.2-4.5, p&lt;0.05)</td>
</tr>
<tr>
<td>(Fergusson and Lynskey 1995a) New Zealand</td>
<td>954 adolescents age 16 in NZ</td>
<td>Cohort</td>
<td>III-1</td>
<td>Family low income (OR=2.8, 95%CI 1.2-6.1, p&lt;0.05), caregivers low SES (OR=2.2, 95%CI 1.4-4.7, p&lt;0.05), increased family history of offending (OR=3.1, 95%CI 1.3-7.5, p&lt;0.05), increased changes of school (OR=3.3, 95%CI 1.5-7.2, p&lt;0.005)</td>
<td></td>
</tr>
<tr>
<td>(Petronis et al. 1990) United States</td>
<td>13,673 young adults</td>
<td>Cohort</td>
<td>III-1</td>
<td>Low educational attainment (p=0.06)</td>
<td></td>
</tr>
<tr>
<td>(Petrie and Brook 1992) UK</td>
<td>114 suicide attempts over 2 years</td>
<td>Cohort</td>
<td>III-1</td>
<td>Unemployment Living alone (no p values)</td>
<td></td>
</tr>
</tbody>
</table>

* In a later paper the population attributable risk of unemployment was calculated for the study to be only 7.3% in people of all ages (Beautrais et al. 1998b).
Table 5. Socio-demographic risk factors and youth suicide (continued)

<table>
<thead>
<tr>
<th>Author</th>
<th>Sample/setting</th>
<th>Study design</th>
<th>Level of evidence</th>
<th>Comments</th>
<th>Results/Conclusions</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Pelkonen et al. 1997) Finland</td>
<td>110 suicidal adolescents compared to 150 other outpatients to a psychiatric institution</td>
<td>Case control</td>
<td>III-2</td>
<td>SES based on caregiver’s status Suicidality rigorously defined and possibly missed in a number of controls Matching of cases/controls with use of hospital based controls</td>
<td>No difference in SES (p&gt;0.05)</td>
</tr>
<tr>
<td>(Andrews and Lewinsohn 1992) United States</td>
<td>Community sample of 1,710 young adults</td>
<td>Nested case control</td>
<td>III-1-2</td>
<td>Structured interview and tight definitions but only based on adolescents in a high school - selection bias from people at greater risk of suicide may have dropped out of school</td>
<td>Poor SES of father (p&lt;0.001)</td>
</tr>
<tr>
<td>(Diekstra 1989) Various OECD countries</td>
<td>Western countries population-based data</td>
<td>Correlational</td>
<td>IV</td>
<td>Correlational study limited ability to impute causation</td>
<td>Increased rates of unemployment, divorce, secularisation, mobility were associated with increased rates of youth suicide (no p values)</td>
</tr>
</tbody>
</table>
Table 6. Parental psychopathology as a risk factor for youth suicidal behaviour

<table>
<thead>
<tr>
<th>Author</th>
<th>Sample/setting</th>
<th>Study design Level of evidence</th>
<th>Particular Methodological issues</th>
<th>Statistically significant association between factors and suicide</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>(Runeson 1989)</td>
<td>Psychiatric autopsy of 53 cases over three year period</td>
<td>Retrospective cohort III-1</td>
<td>Missing data-possible classification bias, No systematic assessment of mental illness in relatives.</td>
<td>Psychiatric illness Among 1st relatives (no p value)</td>
</tr>
<tr>
<td>United States</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Gould et al. 1996)</td>
<td>120 victims &lt; 20 years old</td>
<td>Case control Retrospective psychological autopsy and Community controls III-2</td>
<td>Recall bias from family members possible limitation</td>
<td>Mother with mood disorder (OR=2.0, 95% CI 1.1-3.7, p &lt; 0.05), Father with history of antisocial behaviour (OR=4.0, 95% CI 1.5-10.9, p &lt; 0.01) Family history of suicide (OR=4.6, 95% CI 1.8-11.7, p &lt; 0.001)</td>
</tr>
<tr>
<td>United States</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Brent et al. 1996)</td>
<td>Relatives of 58 victims compared to 55 control relatives</td>
<td>Case control III-2</td>
<td></td>
<td>Family history of suicide and any psychiatric illness (OR=4.3, 95% CI 1.1-16.6)</td>
</tr>
<tr>
<td>United States</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Brent et al. 1994c)</td>
<td>67 adolescents and 67 matched community controls in US</td>
<td>Case control III-2</td>
<td></td>
<td>Parental history of major psychiatric illness (p=0.001)</td>
</tr>
<tr>
<td>United States</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Roy et al. 1991)</td>
<td>11 twin pairs</td>
<td>Retrospective case series IV</td>
<td>Small sample size</td>
<td>Genetic factors related to suicide largely represent genetic predisposition to psychiatric disorders (no p values)</td>
</tr>
<tr>
<td>United States</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Fergusson and Lynskey 1995a)</td>
<td>954 16 year olds</td>
<td>Cohort III-1</td>
<td></td>
<td>Parental offending (RR=3.1, 95% CI 1.3-7.5, p &lt; 0.05) Family drug abuse (OR=2.2, 95% CI 1.0-4.8)</td>
</tr>
<tr>
<td>New Zealand</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Pfeffer et al. 1994)</td>
<td>43 prepubertal children with suicidal behaviour, 16 in-patient controls, 54 community controls, 488 1st degree relatives and 1062 2nd degree relatives</td>
<td>Case control III-2</td>
<td>Associations with 1st degree relatives and family history of antisocial behaviour or suicide (p=0.005), no significant association mood disorders, no significant association with 2nd degree relatives</td>
<td></td>
</tr>
<tr>
<td>United States</td>
<td></td>
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</tbody>
</table>

Not included because sample too small (n<30): (Swedo et al. 1991; Kovacs et al. 1993), number of controls too small: (Reinherz et al. 1995).
**Table 7. Parental loss as a risk factor for suicidal behaviour among youth**

<table>
<thead>
<tr>
<th>Author</th>
<th>Sample/setting</th>
<th>Study design</th>
<th>Methodological issues</th>
<th>Significant association between suicidal behaviour and the following</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Beautrais et al. 1996b)</td>
<td>129 cases, 153 controls Christchurch</td>
<td>Case control III-2</td>
<td>Parental separation (OR=3.0, 95% CI 1.7-5.3, p&lt;0.0001), poor parental relationship (OR=3.1, 95% CI 1.3-7.4, p&lt;0.01)</td>
<td></td>
</tr>
<tr>
<td>New Zealand</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(De Wilde et al. 1992)</td>
<td>48 adolescents attempters and 66 depressed non-attempters, 43 normal</td>
<td>Case control III-2</td>
<td>Increased parental turmoil (p&lt;0.01)</td>
<td></td>
</tr>
<tr>
<td>Netherlands</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Adams et al. 1994a)</td>
<td>35 inpatient attempters, 33 high school ideators compared to 29 unmatched non-suicidal inpatients and 37 students</td>
<td>Case control III-2</td>
<td>Divorced parents (p=0.05)</td>
<td></td>
</tr>
<tr>
<td>Canada</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Andrews and Lewinsohn 1992)</td>
<td>Community sample of 1,710 young adults in Oregon</td>
<td>Nested case control III-1-2</td>
<td>Parental separation and especially absence of father (p&lt;0.001)</td>
<td></td>
</tr>
<tr>
<td>United States.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(De Wilde et al. 1992)</td>
<td>48 attempters compared to 66 with depression and 43 without depression</td>
<td>Case control III-2</td>
<td>Parental separation (p&lt;0.01)</td>
<td></td>
</tr>
<tr>
<td>United States</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Brent et al. 1994c)</td>
<td>67 adolescents and 67 matched community controls</td>
<td>Case control III-2</td>
<td>Parental Separation (p&lt;0.01)</td>
<td></td>
</tr>
<tr>
<td>United States</td>
<td></td>
<td></td>
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</tbody>
</table>

Not included cross sectional study only: (Keinhorst et al. 1990).
Table 8. Parental care and suicidal behaviour among young people

<table>
<thead>
<tr>
<th>Author</th>
<th>Sample/setting</th>
<th>Study design</th>
<th>Methodological issues</th>
<th>Significant association between suicidal behaviour and the following</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Allebeck and Allgulander 1990) Sweden</td>
<td>50,465 conscripts followed over 10 years</td>
<td>Cohort III-1</td>
<td></td>
<td>Relationship with parents not important (no p value)</td>
</tr>
<tr>
<td>(Beautrais et al. 1996b) New Zealand</td>
<td>129 cases and 153 controls</td>
<td>Case control III-2</td>
<td>Poor parental relationship/communication (OR=3.1, 95%CI 1.3-7.4, p&lt;0.01) Childhood institutional care (p&lt;0.0001)</td>
<td></td>
</tr>
<tr>
<td>(Brent et al. 1994c) United States</td>
<td>67 adolescents and 67 matched community controls</td>
<td>Case control III-2</td>
<td>Poor parental relationship with children (p&lt;0.05)</td>
<td></td>
</tr>
<tr>
<td>(Martin and Waite 1994) Australia</td>
<td>681 students</td>
<td>Cross sectional IV</td>
<td>Repeatability and validity of Parental Bonding Index used in study is uncertain</td>
<td>Increased ‘affectionless control’ of parents (p&lt;0.001)</td>
</tr>
<tr>
<td>(Tousignant et al. 1993) Canada</td>
<td>2 surveys in Montreal: 2,327 high school students and 701 young adults</td>
<td>Cross sectional IV</td>
<td>Validity of comparing two surveys undertaken in different populations and using different methods is questionable</td>
<td>Poor parental care by the father was important (p=0.0001) Effect of poor maternal care or divorce less important (p=0.0001)</td>
</tr>
<tr>
<td>(Martin et al. 1995) Australia</td>
<td>352 students in Adelaide</td>
<td>Cross sectional IV</td>
<td>Response rate 84% Validity of scales questionable</td>
<td>Increased family dysfunction on scales (p=0.01)</td>
</tr>
</tbody>
</table>

(Not considered because of inadequate sample size: Morano et al. (1993))
Table 9. Past sexual/physical abuse as a risk factor for suicidal behaviour among youths

<table>
<thead>
<tr>
<th>Author</th>
<th>Sample/setting</th>
<th>Study design</th>
<th>Methodological issues</th>
<th>Significant association abuse and increased risk suicidal behaviour</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Suicide as main outcome</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Brent et al. 1994c)</td>
<td>67 suicide cases compared to 67 matched community controls</td>
<td>Case control</td>
<td>74% participation rate Verdict of suicide used to define cases</td>
<td>Not significant</td>
</tr>
<tr>
<td>(Reinerz et al. 1995)</td>
<td>400 students followed since age 5 years</td>
<td>Cohort</td>
<td></td>
<td>Sexual abuse (no p value)</td>
</tr>
<tr>
<td>(Silverman et al. 1996)</td>
<td>375 adolescents questioned at 15 and 21 years of age</td>
<td>Retrospective study on cohort</td>
<td>52% of original cohort lost to follow-up</td>
<td>Females and physical abuse (OR=6.25, 95% CI 1.9-21.2) and females and sexual abuse (OR=10.7, 95% CI 3.3-35.1)</td>
</tr>
<tr>
<td>(Beautrais et al. 1996b)</td>
<td>129 cases 159 controls</td>
<td>Case control (community controls)</td>
<td></td>
<td>Physical or sexual abuse in childhood (adj OR=3.7, 95% CI 1.6-8.3, p=0.005)</td>
</tr>
<tr>
<td>(De Wilde et al. 1992)</td>
<td>48 attempters and 66 controls with depression, and 43 non-depressed adolescents in schools/institutions</td>
<td>Case control</td>
<td></td>
<td>Physical and sexual abuse (p=0.05)</td>
</tr>
<tr>
<td>(Shaunessy et al. 1993)</td>
<td>27 in-patient attempters compared to 38 unmatched controls</td>
<td>Case control</td>
<td></td>
<td>Physical and sexual abuse (p=0.05)</td>
</tr>
<tr>
<td>(Garnefski and Diekstra 1997)</td>
<td>745 students with history of sexual abuse and 745 without history</td>
<td>Case control</td>
<td></td>
<td>Sexual abuse (p&lt;0.01)</td>
</tr>
<tr>
<td>(Garnefski et al. 1992)</td>
<td>570 high school students</td>
<td>Case control</td>
<td>Use of matched controls limits some comparisons Based on self reported data</td>
<td>Sexual/ Physical abuse (p&lt;0.001)</td>
</tr>
<tr>
<td>(Bayatpour et al. 1992)</td>
<td>272 girls at antenatal clinic who had reported that they had not been abused compared to 52 with prior sexual abuse and 39 physically abused, and 11 both sex and physically abused teenagers</td>
<td>Case control</td>
<td>No definition of suicide attempt etc No between group comparisons</td>
<td>Sexual and physical abuse (p&lt;0.0001)</td>
</tr>
<tr>
<td>(Keinhorst et al. 1992)</td>
<td>48 depressed suicide attempters compared to 66 depressed non-attempters</td>
<td>Case control</td>
<td>Recruitment of subjects from both schools and institutions but not stratified in the analysis</td>
<td>Sex abuse (p&lt;0.05)</td>
</tr>
<tr>
<td>(Riggs et al. 1990)</td>
<td>72 high school students who attempted suicide</td>
<td>Cross sectional IV</td>
<td>Lethality not assessed</td>
<td>Sexual (OR=3.35, 95% CI 1.19-9.45)/ physical abuse (OR=5.23, 95% CI 1.78-15.38)</td>
</tr>
</tbody>
</table>
Table 10. Past sexual/physical abuse as a risk factor for youth suicide in selected populations

<table>
<thead>
<tr>
<th>Author</th>
<th>Sample</th>
<th>Study design</th>
<th>Level of evidence</th>
<th>Association between suicidal behaviour and the following</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Remafedi et al. 1991)</td>
<td>41 gay suicide attempter adolescents compared to 96 non-attempter adolescents</td>
<td>Case control</td>
<td>III-2</td>
<td>Sex abuse (p=0.0008)</td>
</tr>
<tr>
<td>United States</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Deykin and Buka 1994)</td>
<td>300 chemically dependent adolescents</td>
<td>Cross sectional</td>
<td>IV</td>
<td>Physical (p&lt;0.003) and sexual abuse (p=0.001)</td>
</tr>
<tr>
<td>United States</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 11. Personality disorders as a risk factor for suicidal behaviour

<table>
<thead>
<tr>
<th>Author/setting</th>
<th>Sample</th>
<th>Study design</th>
<th>Methodological issues</th>
<th>Association between suicidal behaviour and the following*</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Suicide as main outcome</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Marttunen et al. 1991)</td>
<td>53 victims in national psychological autopsy study</td>
<td>Cross sectional</td>
<td>Retrospective and unblinded data collection and no control group No interviews with peers Had to integrate information from a number of sources</td>
<td>Antisocial or borderline, and narcissistic personality disorders (no p values), 32% of victims had a personality disorder</td>
</tr>
<tr>
<td>Finland</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Runenson 1989)</td>
<td>58 victims in psychological autopsy study</td>
<td>Cross sectional</td>
<td></td>
<td>Antisocial and borderline personality disorders (no p values), 34% of victims had a personality disorder</td>
</tr>
<tr>
<td>Sweden</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Suicide attempt as main outcome</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Beautrais et al. 1996b)</td>
<td>302 serious suicide attempters compared to 1,028 controls</td>
<td>Case control</td>
<td>Conduct disorder or antisocial personality disorder (adj OR=4.4, 95% CI 1.7-11.3, p &lt;0.005)</td>
<td></td>
</tr>
<tr>
<td>New Zealand</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* In all cases the diagnoses were made using DSM-III-R criteria.
### Table 12. Personality traits and suicidal behaviour among youth

<table>
<thead>
<tr>
<th>Author Country</th>
<th>Sample</th>
<th>Study design Level of evidence</th>
<th>Methodological issues</th>
<th>Association between suicidal behaviour and personality trait</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Suicide as main outcome</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Brent et al. 1994a)</td>
<td>43 cases compared to 43 controls in US</td>
<td>Case control retrospective psychiatric autopsy III-2</td>
<td>Aggression and impulsive (p&lt;0.05)</td>
<td></td>
</tr>
<tr>
<td>(Hawton et al. 1993)</td>
<td>62 patients admitted for self poisoning who later died compared to 124 who did not in Edinburgh (Scotland)</td>
<td>Case control III-2</td>
<td>Limited ability to find causes of death outside of study area</td>
<td>Personality disorder higher in completed suicides (p=0.035)</td>
</tr>
<tr>
<td><strong>Suicide attempt as main outcome</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Kashden et al. 1993)</td>
<td>United States 23 suicidal in-patients compared to 20 psychiatric in-patients who were not suicidal</td>
<td>Case control III-2</td>
<td>Small sample Validity and repeatability of measurement needs assessing</td>
<td>Increased behavioural measurements of impulsivity (p=0.03) and hopelessness (p=0.02) among suicidal youth</td>
</tr>
<tr>
<td>(Kashani et al. 1989)</td>
<td>United States Community sample of 210 high school students young adults</td>
<td>Cross-sectional IV</td>
<td>Selection bias telephone and school attendance No formal DSM diagnosis Observations on small numbers of cases</td>
<td>Increased impulsivity (p&lt;0.01), anger tendency to use aggression (p&lt;0.001) to resolve conflict</td>
</tr>
</tbody>
</table>

### Table 13. Sexual orientation and suicidal behaviour among young people

<table>
<thead>
<tr>
<th>Author Country</th>
<th>Study design Level of evidence</th>
<th>Sample</th>
<th>Results/Conclusions</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Shaffer et al. 1995)</td>
<td>United States Case control III-2</td>
<td>120 gay suicide victims compared to 147 matched, community controls</td>
<td>No increased risk of suicide among gay young people (no p value)</td>
</tr>
<tr>
<td>(Remafedi et al. 1991)</td>
<td>United States Case control III-2</td>
<td>41 gay suicide attempter adolescents compared to 96 non-attempter adolescents</td>
<td>Increased risk of suicidal behaviour among homosexual youth (OR=7.1, 95% CI 3.1-16.5)</td>
</tr>
</tbody>
</table>
Table 14. Cognitive styles and suicidal behaviour among young people

<table>
<thead>
<tr>
<th>Author Setting</th>
<th>Sample</th>
<th>Study design</th>
<th>Level of evidence</th>
<th>Methodological issues</th>
<th>Association between suicidal behaviour and cognitive style</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Keinhorst et al. 1992) United States</td>
<td>46 attempters from institutions and schools, 66 depressed and 44 normal controls</td>
<td>Case control</td>
<td>III-2</td>
<td>Increased hopelessness (p&lt;0.01) or inflexible thinking (p&lt;0.05)</td>
<td></td>
</tr>
<tr>
<td>(Rotheram-Borus et al. 1990) United States</td>
<td>77 attempters compared to 39 with psychiatric illness and 23 non-disturbed</td>
<td>Case control</td>
<td>III-2</td>
<td>Inflexible thinking (p&lt;0.01) and poor problem solving (p&lt;0.001)</td>
<td></td>
</tr>
</tbody>
</table>

Table 15. Biological risk factors and suicidal behaviour in youth

<table>
<thead>
<tr>
<th>Author</th>
<th>Sample</th>
<th>Study design</th>
<th>Level of evidence</th>
<th>Methodological issues</th>
<th>Association between suicidal behaviour and biological marker</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Vartiainen et al. 1994) Finland</td>
<td>Two cohorts 10,898 and 11,534 followed over 10-15 years</td>
<td>Cohort</td>
<td>III-1</td>
<td>No association with serum cholesterol (p=0.55-0.69)</td>
<td></td>
</tr>
<tr>
<td>(Graae et al. 1996)</td>
<td>16 suicide attempters, 20 controls in US</td>
<td>Case control</td>
<td>III-2</td>
<td>Reduced alpha activity in attempters (p&lt;0.0001)</td>
<td></td>
</tr>
<tr>
<td>(Cohen et al. 1988)</td>
<td>Review article Post mortem studies and samples from living subjects</td>
<td></td>
<td></td>
<td>Serotonergic activity (p&lt;0.05)</td>
<td></td>
</tr>
</tbody>
</table>
Table 16. Psychiatric illness and suicidal behaviour among young people

<table>
<thead>
<tr>
<th>Author</th>
<th>Setting</th>
<th>Sample</th>
<th>Study design</th>
<th>Methodological issues</th>
<th>Association between suicidal behaviour and psychiatric disorder</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Suicide as main endpoint</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Brent et al. 1988)</td>
<td>United States</td>
<td>27 suicide victims compared to 56 psychiatric in-patients</td>
<td>Case control</td>
<td>Psychological autopsy study – problems include effect of suicide on informant and asymmetric information between cases and controls</td>
<td>Bipolar disorder (p=0.007)</td>
</tr>
<tr>
<td>(Hawton et al. 1993)</td>
<td>United States</td>
<td>62 suicide victims previously hospitalised for self poisoning, 124 hospitalised controls who have not died</td>
<td>Case control</td>
<td></td>
<td>Substance abuse Previous in-patient treatment for any psychiatric condition</td>
</tr>
<tr>
<td>(Kelleman et al. 1992)</td>
<td>United States</td>
<td>442 suicide victims involving a firearm which took place in home, 438 community controls</td>
<td>Case control</td>
<td></td>
<td>Substance abuse (especially alcohol)</td>
</tr>
<tr>
<td>(Read et al. 1993)</td>
<td>United States</td>
<td>27 in-patients who committed suicide compared to 86 living in-patients</td>
<td>Case control</td>
<td></td>
<td>Affective disorders</td>
</tr>
<tr>
<td>(Shaffer et al. 1996)</td>
<td>United States</td>
<td>Psychological autopsy of 120 cases compared to 174 community controls</td>
<td>Case control</td>
<td></td>
<td>Schizophrenia</td>
</tr>
<tr>
<td>(Runeson 1989)</td>
<td>Sweden</td>
<td>58 victims in psychological autopsy study</td>
<td>Cross sectional</td>
<td></td>
<td>Affective disorder Schizophrenia Any recent psychiatric care</td>
</tr>
<tr>
<td>(Marttunen et al. 1991)</td>
<td>Finland</td>
<td>53 victims in national study</td>
<td>Retrospective cross sectional (psychological autopsy)</td>
<td>Retrospective and unblinded data collection and no control group No interviews with peers Had to integrate information from a number of sources</td>
<td>Affective disorders Substance abuse</td>
</tr>
<tr>
<td><strong>Suicide attempt as main outcome</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Westermeyer et al. 1991)</td>
<td>United States</td>
<td>586 psychiatric patients followed up for 13.2 +/- 4.4 years</td>
<td>Cohort</td>
<td></td>
<td>Schizophrenia and other psychotic illnesses (p&lt;0.05)</td>
</tr>
<tr>
<td>(Nielson et al. 1990)</td>
<td>Denmark</td>
<td>5 year follow-up of 207 attempters</td>
<td>Cohort</td>
<td></td>
<td>Depression (adj. RR=3.6, 95% CI 1.3-10.2) Substance abuse (RR=3.4, 95% CI 1.7-6.8)</td>
</tr>
<tr>
<td>Author</td>
<td>Setting</td>
<td>Sample</td>
<td>Study design</td>
<td>Level of evidence</td>
<td>Methodological issues</td>
</tr>
<tr>
<td>----------------------------</td>
<td>------------------</td>
<td>-------------------------------------------------------------------------</td>
<td>--------------</td>
<td>-------------------</td>
<td>----------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>(Allebeck and Afgulander 1990)</td>
<td>Sweden</td>
<td>50,465 male army conscripts Follow-up 13 years</td>
<td>Cohort</td>
<td>III-1</td>
<td>Schizophrenia (adj. RR=13.3, 95% CI 8.2-21.5)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Fergusson and Lynskey 1995b)</td>
<td>New Zealand</td>
<td>Birth cohort of 954 children studied at age 16 years</td>
<td>Cohort</td>
<td>III-1</td>
<td>Affective disorders (OR=16.8, 95% CI 7.5-37.9)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Beautrais et al. 1996b)</td>
<td>New Zealand</td>
<td>302 serious attempters, 1,028 community controls in NZ</td>
<td>Case control</td>
<td>III-2</td>
<td>Substance abuse (adj OR=3.0, 85% CI 1.3-6.7, p&lt;0.01)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Rao et al. 1993)</td>
<td>United States</td>
<td>159 children with major depression and 85 normal controls</td>
<td>Case control</td>
<td>III-2</td>
<td>Major depressive disorder (no p value)</td>
</tr>
<tr>
<td>(Martin et al. 1995)</td>
<td>Australia</td>
<td>352 students</td>
<td>Cross sectional</td>
<td>IV</td>
<td>Depression (p&lt;0.01)</td>
</tr>
<tr>
<td>(Adcock et al. 1991)</td>
<td>United States</td>
<td>3,803 school leavers</td>
<td>Cross sectional</td>
<td>IV</td>
<td>Increased alcohol consumption (p=0.001)</td>
</tr>
<tr>
<td>(Felt et al. 1992)</td>
<td>United States</td>
<td>3,064 school leavers</td>
<td>Cross sectional</td>
<td>IV</td>
<td>Substance abuse (especially cocaine) (p=0.001)</td>
</tr>
<tr>
<td>(Garrison et al. 1993)</td>
<td>United States</td>
<td>3,764 school leavers</td>
<td>Cross sectional</td>
<td>IV</td>
<td>Substance abuse (OR=1.73, 95% CI 1.32-2.26)</td>
</tr>
<tr>
<td>(Andrews and Lewinsohn 1992)</td>
<td>United States</td>
<td>1,710 adolescents</td>
<td>Cross sectional</td>
<td>IV</td>
<td>Substance abuse (male OR=6.6, 95% CI 2.9-15.1, p&lt;0.01) (female OR=9, 95% CI 1.5-5.8, p&lt;0.01)</td>
</tr>
</tbody>
</table>
Table 17. Co-morbid mental disorders as a risk factor for youth suicide

<table>
<thead>
<tr>
<th>Author</th>
<th>Country</th>
<th>Sample</th>
<th>Study design</th>
<th>Significantly increased risk of suicide with co-morbid psychiatric disorders</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Brent et al. 1988)</td>
<td>United States</td>
<td>27 victims compared to 56 psychiatric in-patients</td>
<td>Case control III-2</td>
<td>Yes (OR=2.0, 95% CI =1.1-3.8)</td>
</tr>
<tr>
<td>(Brent et al. 1993a)</td>
<td>United States</td>
<td>67 victims compared to matched community controls</td>
<td>Case control III-2</td>
<td>Yes (p=0.01) Substance use co-morbid with affective disorder (OR=17.0, 95% CI 1.0-294)</td>
</tr>
<tr>
<td>(Shaffer et al. 1996)</td>
<td>United States</td>
<td>Psychological autopsy of 120 cases compared to 174 community controls</td>
<td>Case control III-2</td>
<td>Yes and affective disorder and substance abuse (nearly 70% had co-morbidity especially affective disorder and substance abuse- no p value)</td>
</tr>
<tr>
<td>(Lesage et al. 1994)</td>
<td>Canada</td>
<td>75 male victims compared to 75 matched controls</td>
<td>Case control III-2</td>
<td>Yes (p &lt;0.0001)</td>
</tr>
<tr>
<td>(Marttunen et al. 1991)</td>
<td>Finland</td>
<td>53 consecutive suicide victims</td>
<td>Case series IV</td>
<td>Yes, 51% had co-morbid disorders (no p values)</td>
</tr>
<tr>
<td>(Runenson 1989)</td>
<td>Sweden</td>
<td>58 consecutive suicide victims</td>
<td>Case series IV</td>
<td>Yes, 47% had co-morbid disorders (no p value)</td>
</tr>
<tr>
<td><strong>Suicide attempt as main outcome</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Fergusson and Lynskey 1995b)</td>
<td>New Zealand</td>
<td>954 16 year olds</td>
<td>Cohort III-1</td>
<td>Yes (p&lt;0.05)</td>
</tr>
<tr>
<td>(Beautrais et al. 1996b)</td>
<td>New Zealand</td>
<td>302 serious attempters, 1,028 controls</td>
<td>Case control III-2</td>
<td>Yes, and risk of suicide increases with more disorders (p&lt;0.05) Those with more than 2 current disorders had increased odds of serious suicide (OR=40.4, 95% CI 17.9-91.1)</td>
</tr>
</tbody>
</table>
### Table 18. Environmental risk factors and suicidal behaviour among young people

<table>
<thead>
<tr>
<th>Author</th>
<th>Sample</th>
<th>Setting</th>
<th>Study design</th>
<th>Level of evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>General Stressful events</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Brent et al. 1993b)</td>
<td>67 victims compared to 67 matched community controls</td>
<td>Case control (p&lt;0.0006)</td>
<td>III-2</td>
<td></td>
</tr>
<tr>
<td>United States</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Adams et al. 1994b)</td>
<td>91 suicidal in-patients compared to 155 high school students</td>
<td>Case control (p&lt;0.001)</td>
<td>III-2</td>
<td></td>
</tr>
<tr>
<td>United States</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Gould et al. 1996)</td>
<td>Psychological autopsy 120 cases compared to 147 community controls</td>
<td>Case control (OR=1.9, 95% CI 1.1-3.7, p&lt;0.05)</td>
<td>III-2</td>
<td></td>
</tr>
<tr>
<td>United States</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Rich et al. 1988)</td>
<td>283 suicides psychological autopsy data Recent stress commonly associated with suicide</td>
<td>Cross sectional data (at 6 weeks p&lt;0.003, not significant at 1 year)</td>
<td>IV</td>
<td></td>
</tr>
<tr>
<td>United States</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(De Wilde et al. 1992)</td>
<td>48 attempters compared to 66 with depression and 43 without depression using a rating scale increased risk with more events over preceding year</td>
<td>Cross sectional (p&lt;0.05 for childhood events and p&lt;0.01 for increased events in year before attempt)</td>
<td>IV</td>
<td></td>
</tr>
<tr>
<td><strong>Recent loss</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Morano et al. 1993)</td>
<td>20 cases/20 controls</td>
<td>Case control (p&lt;0.001)</td>
<td>III-2</td>
<td></td>
</tr>
<tr>
<td>United States</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Rich et al. 1988)</td>
<td>283 victims, psychological autopsy data Recent loss associated with suicide</td>
<td>Case series cross sectional data (p=0.04 at 6 weeks, not significant at 1 year)</td>
<td>IV</td>
<td></td>
</tr>
<tr>
<td>United States</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>End of a romantic relationship</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Beautrais et al. 1997b)</td>
<td>129 serious suicide attempters compared to 153 random community controls</td>
<td>Case control (p&lt;0.0001)</td>
<td>III-2</td>
<td></td>
</tr>
<tr>
<td>New Zealand</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Brent et al. 1993b)</td>
<td>67 victims compared to 67 matched community controls</td>
<td>Case control (p=0.009)</td>
<td>III-2</td>
<td></td>
</tr>
<tr>
<td>United States</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Davidson et al. 1989)</td>
<td>14 victims compared to 56 controls</td>
<td>Case control (OR=42.8, 95% CI 2.4-5148)</td>
<td>III-2</td>
<td></td>
</tr>
<tr>
<td>United States</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Exposure to suicide</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Schmidtke and Hafner 1988)</td>
<td>Cross sectional review of suicide rates before/after televised suicide - rates increased by 175%</td>
<td>Quasi experimental (p&lt;0.01)</td>
<td>II-2</td>
<td></td>
</tr>
<tr>
<td>Subgroup analysis on young people</td>
<td>United States</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Simkin et al. 1995)</td>
<td>Cross sectional review No evidence of effect of TV exposure of suicide</td>
<td>Quasi experimental Before and after study (p=0.05)</td>
<td>II-2</td>
<td></td>
</tr>
<tr>
<td>Subgroup analysis on young people</td>
<td>United States</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Brent et al. 1993b)</td>
<td>67 victims compared to 67 matched community controls</td>
<td>Case control</td>
<td>III-2</td>
<td></td>
</tr>
<tr>
<td>United States</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Davidson et al. 1989)</td>
<td>14 victims compared to 56 controls No increase in suicide after personal exposure to suicide</td>
<td>Case control (OR=1.1, 95% CI 0.2-6.6)</td>
<td>III-2</td>
<td></td>
</tr>
<tr>
<td>United States</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Table 18. Environmental risk factors and suicidal behaviour among young people (continued)

<table>
<thead>
<tr>
<th>Author</th>
<th>Sample Setting</th>
<th>Study design</th>
<th>Level of evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Recent motor vehicle crash</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Grossman et al. 1993)</td>
<td>United States</td>
<td>700 suicide victims with a licence compared with 3,494 matched licenced drivers increased risk of recent motor vehicle accident among suicide victims.</td>
<td>Case control (OR=1.9, 95% CI 1.6-2.3) III-2</td>
</tr>
<tr>
<td><strong>Interpersonal conflict</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Beautrais et al. 1997b)</td>
<td>New Zealand</td>
<td>129 serious suicide attempters compared to 153 random community controls</td>
<td>Case control (OR=7.3, 95% CI 4.3-12.6) (p&lt;0.0001) III-2</td>
</tr>
<tr>
<td>(Brent et al. 1988)</td>
<td>United States</td>
<td>27 victims (psychological autopsy data) compared to 57 psychiatric in-patients</td>
<td>Case control (p=0.0001) III-2</td>
</tr>
<tr>
<td><strong>Legal/disciplinary proceedings</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Beautrais et al. 1997b)</td>
<td>New Zealand</td>
<td>129 serious suicide attempters compared to 153 random community controls</td>
<td>Case control (OR=15.8, 95% CI 4.7-53.2) III-2</td>
</tr>
<tr>
<td>(Brent et al. 1993a)</td>
<td>United States</td>
<td>67 suicide victims (psychological autopsy data) compared to 67 community controls</td>
<td>Case control (p=0.0003) III-2</td>
</tr>
<tr>
<td><strong>Availability of a firearm</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Beautrais et al. 1996a)</td>
<td>New Zealand</td>
<td>197 suicide victims compared to 302 serious attempters compared to 1028 community controls Access to firearms not associated with increased risk of suicide (OR=1.4, CI=0.96-1.99)</td>
<td>Case control (adj OR=1.4, 95% CI 0.96-1.99) III-2</td>
</tr>
<tr>
<td>(Brent et al. 1991)</td>
<td>United States</td>
<td>47 victims compared to 47 psychiatric controls increased risk of suicide for those with guns in home</td>
<td>Case control (adj OR=2.1, 95% CI 1.2-3.7) III-2</td>
</tr>
<tr>
<td>(Brent et al. 1993c)</td>
<td>United States</td>
<td>67 victims compared to 67 living community controls Gun possession was associated with increased risk of suicide</td>
<td>Case control (OR 4.4, 95% CI 1.1-17.5) III-2</td>
</tr>
<tr>
<td>(Resnick et al. 1997)</td>
<td>United States</td>
<td>Survey of 12,118 adolescents Ease of access to firearms was associated with suicidal behaviour</td>
<td>Cross sectional (p&lt;0.001) IV</td>
</tr>
<tr>
<td><strong>Recent discharge from a psychiatric hospital</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Goldacre et al. 1993) Based on ALL ages England</td>
<td>Oxford Linkage Study Increased risk of suicide associated with recent (&lt;1 month) release from a psychiatric hospital</td>
<td>Case control (male SMR=50, 95% CI 37-67, female SMR=57, 95% CI 41-77) III-2</td>
<td></td>
</tr>
<tr>
<td><strong>Diagnosis of serious or terminal illness</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Goldston et al. 1997)</td>
<td>United States</td>
<td>High rate of suicidal ideation, but not suicide attempts, among young insulin dependent diabetics up to 12 years after disease onset</td>
<td>Cohort (p=0.02 for ideation, p&gt;0.05 for attempts) III-1</td>
</tr>
<tr>
<td>(Cote et al. 1992) Subgroup analysis</td>
<td>United States</td>
<td>Increased risk of suicide associated with people with certain medical diagnoses</td>
<td>Cross sectional (p&lt;0.05) IV</td>
</tr>
<tr>
<td><strong>Acute intoxication</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Kelleman and Mercy 1992)</td>
<td>United States</td>
<td>442 suicide victims compared to 438 community controls Increased risk of suicide for intoxicated people</td>
<td>Case control III-2</td>
</tr>
</tbody>
</table>
Table 19. The prevalence of psychiatric disorders among suicide victims in psychological autopsy studies

<table>
<thead>
<tr>
<th>Author</th>
<th>Study design Level of evidence</th>
<th>Prevalence of all psychiatric conditions (%)</th>
<th>Prevalence of affective disorders (%)</th>
<th>Prevalence of substance abuse (%)</th>
<th>Prevalence of conduct disorders (%)</th>
<th>Prevalence of schizophrenia (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Brent et al. 1988)</td>
<td>Case control III-2</td>
<td>93</td>
<td>63</td>
<td>41</td>
<td>22</td>
<td>--</td>
</tr>
<tr>
<td>(Runenson 1989)</td>
<td>Case control III-2</td>
<td>&gt;100 (comorbidities)</td>
<td>64</td>
<td>47</td>
<td>--</td>
<td>15</td>
</tr>
<tr>
<td>(Marttunen et al. 1991)</td>
<td>Case control III-2</td>
<td>94</td>
<td>51</td>
<td>26</td>
<td>17</td>
<td>6</td>
</tr>
<tr>
<td>(Brent et al. 1993a)</td>
<td>Case control III-2</td>
<td>90</td>
<td>49</td>
<td>27</td>
<td>28</td>
<td>0</td>
</tr>
<tr>
<td>(Apter et al. 1993)</td>
<td>Case control III-2</td>
<td>81</td>
<td>58</td>
<td>--</td>
<td>5</td>
<td>7</td>
</tr>
</tbody>
</table>

No p values presented and unable to calculate as data not dichotomous.
Table 20. The presence of statistically significant associations between psychiatric conditions and suicidal behaviour in cohort studies

<table>
<thead>
<tr>
<th>Author</th>
<th>Study design Level of evidence</th>
<th>Any disorder</th>
<th>Affective disorders</th>
<th>Psychotic disorders Schizophrenia</th>
<th>Substance abuse</th>
<th>Personality disorder</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Kotila and Lonnqvist 1989b)</td>
<td>Cohort III-1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Allebeck and Allgu-lander 1990)</td>
<td>Cohort III-1</td>
<td>+ (RR=3.1, 95% CI 2.3-4.0)</td>
<td>+ (RR=8.9, 95% CI 4.7-17.1)</td>
<td>+ (RR=13.3, 95% CI 8.2-21.6)</td>
<td>+ (RR=4.3, 95% CI 2.9-6.5)</td>
<td>+ (RR=3.2, 95% CI 2.3-4.5)</td>
</tr>
<tr>
<td>(Rao et al. 1993)</td>
<td>Cohort III-1</td>
<td></td>
<td>+ (no p values)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Fergusson and Lynskey 1995b)</td>
<td>Cohort III-1</td>
<td>+ (RR=16.3, 95% CI 4.9-54.3, p&lt;0.0001)</td>
<td>+ (RR=16.8, 95% CI 7.5-37.9, p&lt;0.0001)</td>
<td>+ (RR=11.5, 95% CI 5.2-25.3, p&lt;0.0001)</td>
<td>+ (RR=13.2, 95% CI 5.9-29.7, p&lt;0.0001)</td>
<td></td>
</tr>
</tbody>
</table>
### Table 21. New Zealand based research that has presented estimates of the strength of the association between different risk factors and suicidal behaviour

<table>
<thead>
<tr>
<th>Risk Factors</th>
<th>(Beautrais et al. 1996b) Unadjusted OR (CI)</th>
<th>(Fergusson and Lynskey 1995a) Unadjusted OR (CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Study Design: Case control</td>
<td>Study Design: Cohort</td>
</tr>
<tr>
<td></td>
<td>Level of Evidence: III-2</td>
<td>Level of Evidence: III-1</td>
</tr>
<tr>
<td>Affective disorder</td>
<td>23.8 (12.2-46.3)</td>
<td>16.8 (7.5-37.9)</td>
</tr>
<tr>
<td>Substance abuse</td>
<td>3.2 (1.9-5.7)</td>
<td>11.5 (5.2-25.3)</td>
</tr>
<tr>
<td>Antisocial disorder</td>
<td>6.5 (3.3-13.0)</td>
<td>13.2 (5.9-29.7)</td>
</tr>
<tr>
<td>No educational qualifications</td>
<td>7.5 (4.1-13.7)</td>
<td>2.2 (1.1-4.7) family</td>
</tr>
<tr>
<td>Unemployed</td>
<td>2.3 (1.3-3.9)</td>
<td></td>
</tr>
<tr>
<td>Low income</td>
<td>7.8 (4.6-13.2)</td>
<td>2.8 (1.2-6.8) family</td>
</tr>
<tr>
<td>Recent residential change</td>
<td>2.2 (1.3-3.6)</td>
<td>2.8 (1.0-7.6)</td>
</tr>
<tr>
<td>Poor parental relationship</td>
<td>6.3 (3.2-12.6)</td>
<td>3.6 (1.5-8.3)</td>
</tr>
<tr>
<td>Low maternal or parental care</td>
<td>4.9 (2.7-8.9)</td>
<td>--</td>
</tr>
<tr>
<td>Sexual abuse</td>
<td>6.5 (3.2-13.2)</td>
<td>--</td>
</tr>
<tr>
<td>Parental separation</td>
<td>3.0 (1.7-5.3)</td>
<td>--</td>
</tr>
<tr>
<td>Parental alcohol problem</td>
<td>7.6 (2.2-26.5)</td>
<td>2.2 (1.0-4.8)</td>
</tr>
<tr>
<td>Criminal offending</td>
<td>--</td>
<td>8.3 (3.6-18.9)</td>
</tr>
</tbody>
</table>

### Table 22. The relationship between the past history of a suicide attempt and completed suicide

<table>
<thead>
<tr>
<th>Author Country</th>
<th>Sample</th>
<th>Study design Level of evidence</th>
<th>Suicide significantly associated with past attempts</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Beck and Steer 1989)</td>
<td>413 attempters followed up for 5-10 years</td>
<td>Cohort III-1</td>
<td>Yes, and future death by suicide closely associated with concealment of index attempt (p&lt;0.001)</td>
</tr>
<tr>
<td>United States</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Garnefski et al. 1992)</td>
<td>185 attempters compared to 185 non-attempters</td>
<td>Case control III-2</td>
<td>Yes (p=0.001)</td>
</tr>
<tr>
<td>United States</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Lesage et al. 1994)</td>
<td>75 male victims compared to 75 matched controls</td>
<td>Case control III-2</td>
<td>Yes (p=0.0001)</td>
</tr>
<tr>
<td>Canada</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Brent et al. 1993a)</td>
<td>76 adolescent suicide victims compared to 67 community controls in USA</td>
<td>Case control III-2</td>
<td>Previous attempts (OR=17, 95% CI 2.3-127.7) and previous ideation (OR=30, 95% CI 4.1-220) (p&lt;0.002)</td>
</tr>
<tr>
<td>United States</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Andrews and Lewinsohn 1992)</td>
<td>1,710 adolescents</td>
<td>Cross sectional IV</td>
<td>Previous attempts or ideation (OR=20, 95% CI 2.0-9.6) (p=0.001)</td>
</tr>
<tr>
<td>United States</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Deykin and Buka 1994)</td>
<td>300 chemically dependent adolescents</td>
<td>Cross sectional IV</td>
<td>Previous attempts or ideation (P&lt;0.001)</td>
</tr>
<tr>
<td>United States</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>
One of the most difficult clinical problems facing the primary care practitioner is the prediction and prevention of youth suicide (Blumenthal 1990b). This review emphasises that the prevention of suicide depends on the early recognition of those young people who are most at risk of suicidal behaviour. In Section B a biopsychosocial model was developed that characterised which young people were at highest risk of suicidal behaviour. This model identified that young people with an underlying psychiatric illness were most at risk of undertaking these behaviours. In addition, other sociodemographic, family characteristics, and environmental factors were also important determinants of risk.

In the three sections of Part 2 of this review, knowledge about the risk factors identified in Section B is translated into practical assessment and treatment strategies that the primary health care professional can use with suicidal young people. Section C focuses on the recognition of suicidal young people while Section D presents a review of the management of suicidal young people. Finally, Section E reviews the effectiveness of interventions to prevent suicidal behaviour; either based on population strategies that are aimed at groups of (usually) healthy young people or targeted interventions that are directed at high-risk individuals. A significant advantage of the biopsychosocial model presented in Section B is that a wide range of interventions to prevent suicidal behaviour in young people can be considered.

Although it is beyond the scope of this report to present a comprehensive review of the recognition and treatment of psychiatric disorder(s) among young people, the reader is reminded that psychopathology is the most important underlying risk factor for both the development and the expression of suicidal behaviour among young people. The identification and management of psychiatric illness should be regarded as a vital and integral component of any strategy to prevent suicidal behaviour among young people.
Primary care professionals are centrally placed to recognise and initiate treatment for adolescents with mental illness. These professionals (principally GPs) have been recognised as the main gatekeeper through whom most adolescents will receive both the diagnosis and the treatment for their mental illness (Gater and Goldberg 1991). However, research findings suggest that a considerable amount of mental illness and many suicidal young people were unrecognised by health professionals. Although adolescents with suicidal behaviour do frequently attend health professionals (usually GPs) around the time of their event, their elevated risk of suicide was frequently not recognised by the doctor (See Table 23).

Two community-based surveys of adolescents by Velez and Cohen (1988) and Garrison et al. (1993) have both reported that only approximately 20-27% of adolescents who had attempted suicide subsequently received any medical attention. Despite the low rate of medical attention among young suicide attempters, two retrospective case reviews (Appleby et al. 1996; Van Casteren et al. 1993), found that a significant percentage (27%-60%) of suicidal people had contact with a health professional (principally GPs) close to the time of their attempt. By contrast, a small case control study by Vassilas and Morgan (1993) found that suicidal young people prior to their attempt were no more likely than their non-suicidal peers to consult a GP. Three studies have reported that the elevated risk of suicide among adolescents who subsequently made an attempt within one month of attending a primary care physician was infrequently recognised by the doctors who had been consulted prior to the event (Slap et al. 1989; Appleby et al. 1996; Diekstra and van Egmond 1989).

Although the studies that have investigated the identification of suicide risk among adolescents do have a number of serious methodological limitations e.g. small numbers, retrospective design, reliance on case note based information their results are generally consistent with other research that has concluded that many episodes of mental illness (especially depression) among young people are also unrecognised by patients and professionals, and consequently are left untreated. Newman et al. (1996) found that 25% of a New Zealand based cohort did not seek medical care for their mental illness. Similarly, Lewinsohn in another community based survey found that only 23% of adolescents had received any treatment for their first episode of major depression. Whitaker et al. (1990) found that only 41% of a group of young people who had been diagnosed after interview as having experienced a major episode of psychiatric illness had ever consulted any health professional in relation to their symptoms. More than 80% of the members of a bipolar consumer organisation all of whom had experienced the onset of their disease before 20 years of age, reported that they had waited for over a year before they had sought help and when they did consult a doctor in over 75% of cases their condition was initially incorrectly diagnosed (Lish et al. 1994).

Three studies have formally investigated the differences between parent and young persons’ reports of mental illness and those of primary care doctors (See Table 24). Although the actual results of the studies would be expected to vary in relation to the different definitions and settings that have been used in each of the different studies, there is a consistent finding that primary care doctors under-diagnose mental illness when it is present, although their ability to recognise its absence may be better.

The under recognition of mental illness implies that these conditions also remain under-treated in young people. The difficulty for adolescent people in obtaining treatment for their mental illness is concerning because evidence exists that the delayed treatment of mental illness in this age group can result in both immediate and long term harm to the individual, their families and society. The period between the onset of major mental illness and treatment can be characterised by severe behavioural disturbance, family distress and morbidity for the patient as well as their family and friends (Johnstone et al. 1986). Helgason (1990) found in a prospective cohort study that better outcomes for adolescent patients were associated with those individuals who received earlier treatment for their first episode of serious mental illness. Early treatment has been associated with shorter in-patient care and fewer episodes of subsequent hospitalisation, and consequently less expensive treatment for adolescents with serious mental illnesses (Loebel et al. 1992).
The possibility of under-recognition and under-treatment of depression among young people is especially concerning because the condition is common and because the disorder can be readily treated with modern therapy (National Health and Medical Research Council 1997). New Zealand based research has found that the prevalence of depression over a 12 month period may be as high as 16.7% for 18 year old adolescents (See Table 25).

Despite the high prevalence of depression among young people several (overseas based) studies have found that many episodes of depression were not recognised by primary care practitioners (Keller et al. 1991a; Sawyer et al. 1990; Cooper and Goodyer 1993). The under-recognition of depression denies young people access to effective interventions that could treat their condition (National Health and Medical Research Council 1997). Good evidence exists from randomised controlled trials that psychotherapeutic and pharmacological (primarily SSRIs) interventions are very effective at treating depression among young people (See Section E).

**WHY IS MENTAL ILLNESS AND SUICIDALITY UNDER-RECOGNISED AMONG YOUNG PEOPLE?**

There are a number of possible reasons for why mental illness and suicide attempts might frequently be left undiagnosed and untreated among adolescents. These reasons include difficulties with the recognition of mental disorders by professionals, parents, teachers, and among the teenagers themselves along with their peers. A number of the potential reasons have been presented in the literature, however it must be recognised that these possibilities have usually not received any evaluation and are often just based on the opinions of health professionals, and less frequently, adolescents (See Table 26).

**OVERCOMING THE BARRIERS TO PRIMARY CARE FOR ADOLESCENTS**

Many authors have addressed the need to reduce the barriers for young people to receiving both an appropriate diagnosis and the best treatment for their mental illness as well as the prevention of suicide among this age group. However, most of the literature that has been published has been based solely on the opinions of health professionals.

**Practice based methods**

Health professionals can help overcome many of the barriers that may prevent the adolescent from seeking care. For example, practitioners can ensure that their reception staff are aware of the importance of making adolescents feel welcome, and maintain flexibility with appointment times to accommodate adolescents while emphasising the confidential nature of all consultations (Press and Khan 1997; Sanci and Veit 1995) (See Table 27). The waiting room should contain some posters, magazines and written material that are appropriate for adolescents (Sanci and Veit 1995). Cost savings from budget holding can be used by groups of GPs (or others) to target adolescents to receive free or subsidised services.

Improved specialist services for adolescent mental health and good communication between these services and primary care practitioners would also improve the access for young people to treatment for their mental illness (National Health and Medical Research Council 1997).

A public education campaign designed for adolescents, schools and parents to inform them that primary care providers are available, interested and capable of looking after the health care needs of adolescents including their mental health could overcome some of the psychological barriers of these groups and improve access to care for young people (National Health and Medical Research Council 1997).

**Consultation-based skills to reduce barriers for treatment among adolescents**

Some adolescents may regard adults as incapable of understanding their world, considerable effort is required to engage these young people in a therapeutic relationship (National Health and Medical Research Council 1997).

An understanding of the essential physical, emotional and psychological changes that are part of adolescence has been cited by a number of experts as essential knowledge to underpin effective consulting with adolescents (Sanci and Veit 1995; Veit and Schwarz 1995; Blair and Bowes 1995; Sanci and Young 1995; Gilchrist 1991). These changes include issues associated with a process of forming a self-identity and gaining autonomy. The development of sexual identity and body image, establishing relationships with peers, and gaining respect for both others and themselves are all important tasks of adolescence (based on: Sanci 1995; Blair and Bowes 1995). Recognition of these changes and the issues often associated with them (such as conflicts with parents and authority figures, concern with maintaining popularity with peers and frequent distress with relationship
Consultation techniques

- Treat the young person with respect and identify from the outset that they (and not their parents or teachers) are the patient - for example, when the patient is accompanied by his/her parents greet the young person before acknowledging the parents (Sanci and Young 1995; Goldenring and Cohen 1988).
- Exhibiting friendliness, warmth and an interest in the activities and concerns of the adolescent are important (Blair and Bowes 1995; Lartigue and Lartigue 1990a).
- When the patient is escorted by friends or relatives the adolescent should be invited to be seen alone during the consultation (Goldenring and Cohen 1988; Sanci and Veit 1995; Sanci and Young 1995; Blair and Bowes 1995). It may also be helpful, with the patient’s consent, to separately interview the patient’s parents (or other significant person) as well. A family or combined interview can be informative about the adolescents’ relationships with their significant others and provide information about the emotional support available to the patient along with an insight into the dynamics in which the individual is living (Roter and Hall 1994). Obtaining information from more than one source can be particularly important in any assessment of the mental status of the patient when insight may be clouded. Several studies have found that there are significant discrepancies between the reports of adolescents and those of their parents with regard to the occurrence of episodes of mental illness e.g. Marttunen et al. (1995), Nelson et al. (1988), Newman et al. (1996). People close to the individual can provide important information about any alterations in the behaviour of the patient, or changes in their relationships with the individual, while the patient can usually narrate their own historical account of their symptoms.
- It is important to clearly inform the adolescent of the confidential nature of the therapeutic relationship, which will be respected in all situations except an extreme emergency (Blair and Bowes 1995; National Health and Medical Research Council 1997). However, it should also be explained that some information may be shared with other professionals to assist with the care of the patient and itemise what may be disclosed (National Health and Medical Research Council 1997).
- Listen carefully, compliment the adolescent on their strengths and avoid arguments (Sanci and Young 1995).
- Maintain an empathic non-authoritarian attitude and involve the adolescent patient in the clinical decision-making (Lartigue and Lartigue 1990a; Press and Khan 1997). Compliance may be enhanced by sharing with the patient ‘ownership’ over the treatment plan and allowing them to shape it towards their lifestyle and beliefs (Court 1992; Blair and Bowes 1995). Sometimes it may be necessary to compromise from the ideal treatment in order to ensure a treatment plan that the adolescent will accept and follow (Roter and Hall 1994).
- It is especially important to be clear and precise in communicating with an adolescent who may be suicidal, because they may often be confused or in a state of chaotic feelings in relation to a mental illness or recent stressful event (Keinhorst 1995).
- Ensure that the practitioner is relaxed with the adolescent and does not adopt a false persona. In particular, the practitioner should talk freely with the adolescent without falsely trying to adopt the adolescent’s colloquialisms. By contrast, the use of professional jargon should also be avoided. Communication should therefore be at a level that the person can understand and frequent direct questioning of comprehension may be necessary (Friedman and Litt 1986).
- Ensuring that goals are clear and set in an immediate time frame is important (Friedman and Litt 1986). Adolescents do not respond well to distant and vague concepts such as the need to change their behaviour in order to prevent the development of a disease in the distant future (Friedman and Litt 1986; Blair and Bowes 1995).
- Involvement of family or peers in the treatment of an adolescents can help promote a support network to become established for the patient (Tebbi 1993). The people in this network can provide emotional as well as practical support, for example by driving the patient to appointments or by acting as an advocate for the young person. Care must be exercised that consent is obtained from the adolescent and that the involvement of family or peers will not increase friction (Blair and Bowes 1995).
- Allocate sufficient appointment time for the needs of the adolescent. The initial assessment
of the young person may take a substantial amount of time (National Health and Medical Research Council 1997).

- The interview needs to be specifically tailored to engage the adolescent. The use of open questions or reassurances such as “many young people I see feel sad do you feel like that” (National Health and Medical Research Council 1997) may be helpful.
- Maintaining contact with follow-up visits or by telephone is important with the care of adolescents. When the patient fails to attend for a scheduled appointment it may be appropriate to telephone him/her to check on how they are progressing (Blair and Bowes 1995).

**IMPROVING THE RECOGNITION OF SUICIDE RISK**

A key issue in recognising the potential for suicide among young people is the maintenance of a high index of suspicion about the possibility of self harm among young people coupled with a knowledge of which adolescents are at highest risk of making an attempt (National Health and Medical Research Council 1997; Kashani et al. 1989; Jackson et al. 1995).

**Risk behaviours and high-risk groups**

The groups of adolescents at highest risk of either suicidal death or of making an attempt have been characterised in Section B. The principal risk factors for suicide have been identified as (based on: (Garland and Zigler 1993a; Page 1996):

- serious mental illness especially depression, schizophrenia, and personality disorders or substance abuse. Co-morbidity with more than one of these conditions further increases the risk
- prior suicide attempt
- antisocial, aggressive or impulsive personality traits
- family history of suicidal behaviour
- disadvantaged socioeconomic and educational background.

In addition a number of other factors can be additional risk factors (or possibly triggers which heighten the risk of suicide among those young adults with any primary risk factors). These additional factors include:

- media coverage of suicide
- intoxication
- recent loss, conflict, humiliation or trouble with authority
- other life stresses.

**Risk behaviours**

Some experts have stated that certain behaviours may be signs of potential or impending suicide (Low and Andrews 1990; Blumenthal 1990b; Atala and Baxter 1989; Page 1996). These behaviours include:

- numerous accidents
- extreme risk taking and dangerous behaviour
- discussing death/morbid themes
- giving away favourite possessions
- organising personal affects and arranging wills
- school problems, disciplinary problems and truancy
- antisocial behaviour
- social isolation and impulsivity
- possessing or buying a weapon or other means of suicide
- belligerent or acting out behaviour
- running away from home.

Although there is little quantitative evidence, these signs have intuitive appeal as representing possible cues that an individual is planning to kill him (her) self.

Expert opinion articles frequently cite the need to explicitly question adolescents on their propensity to kill themselves (Jackson et al. 1995; Blumenthal 1990b; Atala and Baxter 1989). These experts stated that while there is no evidence that direct questioning will harm the patient by giving them ideas they may not have had already, adolescent patients will often be grateful for the opportunity to express their distressing suicidal plans if directly questioned. Furthermore, the experts also cited the evidence that adolescents commonly present to health professionals prior to an attempt and suggested that they commonly do not voluntarily verbalise their future plans for suicide unless they are presented with direct questions.

**Questioning for suicide risk**

Questioning should be clear and direct (Blumenthal 1990b) and undertaken in a non-judgemental, deliberate and non-threatening manner (Atala and Baxter 1989). In addition observation of the patient and questioning of their friends and parents are often useful (Kalogerakis 1992). Aside from information on the patient’s risk of suicide the aim is to gather information on the patient’s internal and external support systems (Atala and Baxter 1989).

Most experts suggest that the following clear and direct questions are the most appropriate method to determine an adolescent’s risk of suicide (Blumenthal 1990b; Atala and Baxter 1989; Rittner et al. 1995; Hofmann and Dubovsky 1991; Buzan and Weissberg 1992; Page 1996; Edwards and Pfaff
When there is suicidal ideation the following questions may gauge the strength of the ideation, and the likelihood that it will be carried out. In addition, it may also be prudent to inquire about homicidal thoughts using similar questions (based on: Veit and Schwarz 1995; Ministry of Health, Mental Health Services 1993; Atala and Baxter 1989; Rittner et al. 1995; Hofmann and Dubovsky 1991; Buzan and Weissberg 1992):

- Have you ever tried to kill yourself before?
- Have you thought about suicide?
- Have you planned how you will kill yourself?
- Do you have access to a firearm?
- Do you have the means available?
- In addition, questioning about the presence of any precipitating stressful event(s) should also be undertaken.

When an attempt has been made it is helpful to question the adolescent about the following aspects of the attempt (after: Trautman and Shaffer 1989; Blumenthal 1990b):

- planning (was there premeditation of the attempt, were possessions given away etc)
- lethality i.e., the circumstances of the attempt especially who was nearby and whether discovery was likely, the knowledge of the person about the dangerousness of the method of suicide and their intention to kill themselves
- history of previous suicidal ideation and/or attempts
- any precipitants for the event.

However, these questions have been exposed to only limited empirical scrutiny. A small cross sectional study was undertaken by Pearce and Martin (1994) of 307 high school students in the US. This study examined the results of a questionnaire completed by the students and evaluated the composite ability of the questions to discriminate suicide attempters from non-attempters. The study found that the series of questions had a high specificity (98%) but only moderate sensitivity (40%). Limitations of the study include its small size, use of a highly selected population and cross sectional design. No inferences can be made about the temporal relationship between answers to the questions and actual behaviour and hence their predictive value cannot be ascertained. In addition the study was not based in a clinical setting and does not evaluate the use of the questions as a screening tool for clinicians.

In relation to the high number of young adults who undertake suicidal behaviours while having evidence of a serious mental illness, an assessment of mental status is also a key component of any assessment of suicide risk (Ministry of Health, Mental Health Services 1993). A mental status examination is also indicated, the minimal requirements of which usually include assessment of orientation, state of consciousness, cognitive functioning, contact with reality, logicality of thought processes, and insight and judgement (See Table 28). A general medical history with attention to recent diagnoses and chronic illness is appropriate, along with a psychosocial history (including information about presenting symptoms, relationships with family and friends, life stresses, substance use, and personality factors) and review of the family history (especially with regard to mental illness) is also indicated (Blumenthal 1990b). Any family history of mental illness is also important information to gather. Other information may be available from other sources such as friends or family members.

In conclusion, although no proven protocol exists there is a general consensus from expert opinion in the literature that clear direct questioning about risk factors is the most appropriate method to assess the risk of suicide for a patient. While it is recognised that none of the risk factors is entirely predictive at the individual level they do provide a reasonable working guide for clinicians to determine which patients are most at risk (Aoki and Turk 1997).

**SCREENING TOOLS**

A number of psychometric tools have been presented in the literature to screen for suicide risk in adolescent/child populations. Most of the scales offer a number of questions and seek graded responses that can be totalled to define a composite score that assesses overall suicide risk. The scales vary in their method some probe for underlying risk factors such as suicidal ideation or attempts, others broadly characterise the presence of mental illness especially depression, and finally some assess the young person’s philosophical attitude to life and death. Most of the scales are focused on ideation and do not accurately predict the likelihood of suicidal behaviour for the clinician. In addition, the purpose of the scales has not always been clear, in particular, whether they are intended for research or clinical use, and if intended for clinical use, for what population are they most appropriate.

Few of the scales have satisfactory reliability and validity and few of the scales have been applied to young adults (Garrison et al. 1991b). Finally, most of these tools have only been used in research. Consequently no evaluations exist of a psychometric tool that has been used in actual clinical practice and for which there is adequate evidence about its sensitivity, specificity and predictive value. Lewinsohn et al. (1989) therefore reviewed 29 measures of suicide risk.
risk applicable to adolescents, and concluded that predictive validity has not been documented for any of them. In the absence of this information there is insufficient evidence to warrant the adoption of any tool.

A major underlying problem with these scales (and any actuarial prediction of suicide risk) is that there is a relatively high base rate of risk factors in the general population compared with the relative rarity of suicide. That is, suicide is a relatively rare event in adolescence, although risk factors such as depression and substance abuse are relatively common. While there may be at any one time a relatively high number of adolescents among the high-risk groups, relatively few will kill themselves (Shaffer 1996).

A related issue is that risk factors for an individual cannot necessarily be generalised to a large population conversely risk factors in a large population do not necessarily apply to a given individual (Kienhorst et al. 1999b). In the clinical situation, risk assessment is based on the individual, and represents the composite evaluation of all the relevant information about risk factors and it is not confined to a predetermined series of questions. That is, the instrument to assess risk is personalised. Furthermore, it is probable that a considerable amount of information about suicide risk of an individual may be generated from often non-verbal information derived from the interaction of the assessor with the patient. Significantly, no large study has attempted to compare clinical judgement with a score on any assessment instrument.

Another underlying problem related to screening tools was demonstrated in the study by (Larzelere et al. 1996). This study found that it is clearly unethical to examine the outcome of a group at high-risk of suicide without also providing the group with intensive treatment. These patient groups are the most appropriate for a study of the predictive ability of a clinically administered screening tool, however the predictive power of the scale is then influenced by the treatment that these patients receive.

In conclusion, screening devices remain generally unhelpful in the evaluation of which patients are at highest risk of suicide (Gunnell and Frankel 1994; Goldstein et al. 1991). Considering the relative inability of these screening devices to accurately identify which young people were most at risk of suicide, is not surprising that a previous attempt to introduce screening instruments into the assessment of suicide risk among prison inmates in English and Welsh prisons failed to reduce the number of suicides between 1972-1987 (Dooley 1990).

Accepting that screening devices are relatively ineffective it is not surprising that relatively few clinicians actually use these instruments in their practice (Jobes et al. 1995), preferring instead to pose direct questions about risk factors (Truant et al. 1991). Given that a considerable amount of information is generated by the interaction between the clinician and the patient which cannot easily be placed in a series of scales it is not unexpected that most screening devices have proven to be of limited value (Kral and Sakinofsky 1994). An empirical investigation based in the United States has clearly documented that clinicians primarily use an assessment of the presence (or absence) of known risk factors for suicide as their most important criterion when considering whether to hospitalise a suicidal adolescent (Morrissy et al. 1995). The corollary of this conclusion is that for physicians to continue to be effective gatekeepers they need to be kept up to date with the latest information on the proven risk factors for suicide among adolescents.

### SUMMARY OF BARRIERS TO CARE FOR YOUNG PEOPLE AND THE IDENTIFICATION OF SUICIDE RISK

In summary key points include:

- Young people frequently attend a GP close to the time of a suicide attempt.
- Mental illness in young people (especially depression) and suicide risk is under-recognised and under-treated by GPs.
- The early diagnosis and treatment of mental illness is important to improve outcome for young people.
- A number of societal, GP and patient related factors have been cited by experts as possible causes for the under-recognition of mental illness and suicidality by GPs among young people.
- Experts have identified several practice and consultation based techniques that could potentially reduce the barriers to treatment in primary care for young people.
- The recognition of those groups of young people most at risk of suicide would be improved if primary care practitioners were vigilant for youths with the main risk factors for suicide (psychiatric illness, disadvantaged backgrounds, psychosocial stresses).
- Increased education of GPs in the risk factors for suicide could improve their ability to recognise suicidal young people and prevent suicidal behaviour in this group.
- Increased education of GPs in methods to detect mental illness (especially depression) among young people could improve their recognition of these disorders and improve health outcomes for young people.
The assessment of the suicide risk of the individual is best undertaken by direct questioning of the young person’s wish to die, the lethality of any plans and the consideration of any recent stressful precipitants. In addition, a general assessment should be made that includes attention to the details of the person’s past medical, psychiatric and psychosocial history along with a mental status examination.

Psychometric screening tests are not currently helpful for the primary care clinician in formulating their assessment of a young person’s suicide risk.
<table>
<thead>
<tr>
<th>Author and Year</th>
<th>Country</th>
<th>Sample</th>
<th>Study design</th>
<th>Level of evidence</th>
<th>Methodological Issues</th>
<th>Results/Conclusions</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Velez and Cohen 1988)</td>
<td>United States</td>
<td>Random population-based survey of 752, 9-18 year olds</td>
<td>Cross sectional</td>
<td>IV</td>
<td>Only 27% of suicide attempts received medical attention (p&lt;0.01)</td>
<td></td>
</tr>
<tr>
<td>(Garrison et al. 1993)</td>
<td>United States</td>
<td>3,764 high school students in North Carolina</td>
<td>Cross sectional</td>
<td>IV</td>
<td>Only 20% of suicide attempts received medical attention (p&lt;0.05)</td>
<td></td>
</tr>
<tr>
<td>(Appleby et al. 1996)</td>
<td>United Kingdom</td>
<td>61 young suicide victims who attended GP in three months prior to death</td>
<td>Retrospective case series</td>
<td>IV</td>
<td>Despite increased number of consultations prior to death significant suicide risk had not been noted at any of the final GP visits (p=0.001)</td>
<td></td>
</tr>
<tr>
<td>(Vassilas and Morgan 1993)</td>
<td>United Kingdom</td>
<td>Retrospective case series of suicide 51 victims aged &lt;35 years compared to matched controls</td>
<td>Case control</td>
<td>III-2</td>
<td>Young suicide victims were not more likely to have consulted their GP four weeks before death (p&gt;0.05)</td>
<td></td>
</tr>
<tr>
<td>(Diekstra and van Egmond 1989)</td>
<td>Netherlands</td>
<td>Data gathered on 150 suicide cases and 712 attempts from sentinel GP practices between 1979-1986</td>
<td>Case series</td>
<td>IV</td>
<td>Nealy 50% had contact with GP prior to undertaking suicidal behaviour. GP recognised suicide risk in 43% of victims and 31% of attempters (no p values)</td>
<td></td>
</tr>
<tr>
<td>(Slap et al. 1989)</td>
<td>United States</td>
<td>332 patients aged 12-19 years attending a medical clinic</td>
<td>Retrospective case series</td>
<td>IV</td>
<td>Only 17% of young suicide attempters had been asked about suicide behaviour during attendance at clinic (no p value)</td>
<td></td>
</tr>
</tbody>
</table>
### Table 24. Differences between parent and young persons’ reports of mental illness compared to that of the GP

<table>
<thead>
<tr>
<th>Study Country</th>
<th>Study design Level of evidence</th>
<th>Sample</th>
<th>Results/Conclusions</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Costello 1989a)</td>
<td>Cross sectional IV</td>
<td>789</td>
<td>Primary care paediatricians identified only 26% of parent-child reported mental illness</td>
</tr>
<tr>
<td>United States</td>
<td></td>
<td>7-11 year olds in two HMOs</td>
<td></td>
</tr>
<tr>
<td>(Dulcan et al. 1990)</td>
<td>Cross sectional IV</td>
<td>300</td>
<td>Primary care paediatricians specificity of diagnosis of mental health problems was 89% but sensitivity was merely 17%</td>
</tr>
<tr>
<td>United States</td>
<td></td>
<td>7-11 year olds in two HMOs</td>
<td></td>
</tr>
<tr>
<td>(Garralda and Bailey 1986)</td>
<td>Cross sectional IV</td>
<td>271</td>
<td>GPs diagnosed only 50% of children who had been defined by parents as having a disorder</td>
</tr>
<tr>
<td>United Kingdom</td>
<td></td>
<td>7-12 year olds at eight GP surgeries</td>
<td></td>
</tr>
</tbody>
</table>

(no p values)

### Table 25. Twelve-month prevalence of major depression among young people

<table>
<thead>
<tr>
<th>Author Country</th>
<th>Study design Level of evidence</th>
<th>Sample</th>
<th>Result 12 month period prevalence (%) of group with major depression</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Fergusson et al. 1993)</td>
<td>Cohort III-1</td>
<td>Young people aged 15 years</td>
<td>4.2%(95% CI 3.2-5.2)</td>
</tr>
<tr>
<td>New Zealand</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(McGee et al. 1990)</td>
<td>Cohort III-1</td>
<td>Young people aged 15 years</td>
<td>3.1%(95% CI 2.3-3.9)</td>
</tr>
<tr>
<td>New Zealand</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Feehan et al. 1994)</td>
<td>Cohort III-1</td>
<td>Young people aged 18 years</td>
<td>16.7%(95% CI 14.3-17.0)</td>
</tr>
<tr>
<td>New Zealand</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(CI estimated by calculation assuming dichotomous data as per: Schoenberg 1983)
Table 26. Barriers that prevent young people from receiving treatment in primary care (Primarily based on overseas expert opinion, Level V evidence)

<table>
<thead>
<tr>
<th>Factor (Authors of relevant studies)</th>
<th>General, societal factors</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>The misperception that mental illness is part of the “turmoil” of youth (Lincoln and McGorry 1995; National Health and Medical Research Council 1997)</td>
</tr>
</tbody>
</table>

| Factors related to young people | 
|--------------------------------|--------------------------|
| Young people prefer to seek help for their health problems from peers instead of professionals (Rickwood 1992; Boldero and Fallon 1995) |
| Young people underestimate their need for professional help when they are psychologically ill (Wells et al. 1994) |
| Financial barriers prevent attendance (Chavasse et al. 1995), |
| Fear that they are going ‘crazy’ may make adolescents reluctant to share their symptoms or creates denial (National Health and Medical Research Council 1997) |
| The illness itself may be an important factor in the reluctance of the adolescent to seek or maintain medical care (National Health and Medical Research Council 1997) |

| Factors related to GP | 
|----------------------|--------------------------|
| There is a different presentation of mental illness among teenagers, adolescents may often present somatic complaints as the only symptom(s) of their psychologic problems and therefore diagnosis is difficult (Blum and Smith 1988; Rowe 1997; Muramoto and Lehan 1993; Chang et al. 1988; Costello 1989b) |
| Difficulties exist with the recognition and treatment of young people who often have psychiatric comorbidities e.g. substance abuse and an affective disorder (Muramoto and Lehan 1993; Smeeton et al. 1992) |
| Inadequate training of health professionals to effectively recognise and treat mental illness (Blum and Smith 1988; Liebelt et al. 1993) |
| Health professionals’ discomfort in dealing with adolescents (Veit and Schwarz 1995; Blum and Smith 1988; Liebelt et al. 1993) |

| Factors related to interaction of young person/GP | 
|-----------------------------------------------|--------------------------|
| Lack of belief by the adolescent that the health professional is interested or able to help them, poor rapport or communication (Rowe 1997; Chavasse et al. 1995; Lincoln and McGorry 1995; National Health and Medical Research Council 1997; Boldero and Fallon 1995) |
| General mistrust of adults and/or problems communicating with them (National Health and Medical Research Council 1997) |
| Unfavourable venues or opening times, unappealing clinics or discomfort with clinic support staff (Lincoln and McGorry 1995; National Health and Medical Research Council 1997). |
| Difficulties of receiving health care when a parent may be present or the adolescent fears that their parents will be informed of their problem (Veit and Schwarz 1995; Purcell et al. 1997; Chavasse et al. 1995) |
| Inadequate or perceived to be inadequate amount of time for health professionals to assess health needs of adolescents (Veit and Schwarz 1995; Jacobson et al. 1994) |
| Non-compliance by adolescents with any investigations/treatment (Spirito et al. 1992; Spirito et al. 1994; Keller et al. 1991b) |
| Young people are less accepting of pharmacological treatments and their side effects than adults (National Health and Medical Research Council 1997) |
| Lack of specific research evidence that there are effective treatments for mental illness in this age group (National Health and Medical Research Council 1997) |

| Factors related to the health system | 
|------------------------------------|--------------------------|
| Lack of appropriate health care specialist services and venues for adolescents (Chavasse et al. 1995) |
| Problems with cooperation between groups involved in care of adolescents (National Health and Medical Research Council 1997) |

(no p values)
Table 27.  Practice and consultation based methods to overcome the barriers to treatment for young people in primary care (Primarily based on overseas expert opinion, level V evidence)

<table>
<thead>
<tr>
<th>Method to reduce barriers to care for young people (Author(s) of relevant study(s))</th>
<th>Practice based methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ensure staff and surroundings are welcoming (Sanci and Young 1995; Press and Khan 1997)</td>
<td></td>
</tr>
<tr>
<td>Provide flexible appointments (Sanci and Young 1995)</td>
<td></td>
</tr>
<tr>
<td>Maintain good communication with other services for young people (National Health and Medical Research Council 1997)</td>
<td></td>
</tr>
<tr>
<td>Consider an education campaign to inform young people of interest, availability and expertise of primary care practitioners (National Health and Medical Research Council 1997)</td>
<td></td>
</tr>
<tr>
<td>Consider the provision of subsidised appointments (Sanci and Veit 1995)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Consultation based techniques to reduce barriers to care</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Background understanding of developmental issues for adolescents (Sanci and Young 1995; Blair and Bowes 1995; Veit and Schwarz 1995; Gilchrist 1991; Sanci and Young 1995)</td>
<td></td>
</tr>
<tr>
<td>Respect for young persons individuality and autonomy (Sanci and Young 1995; Goldenring and Cohen 1988)</td>
<td></td>
</tr>
<tr>
<td>Establish rapport (Blair and Bowes 1995; Litt and Cuskey 1980; Lartigue and Lartigue 1990)</td>
<td></td>
</tr>
<tr>
<td>If accompanied, obtain information from the young persons friends/family as appropriate but at least offer the option of seeing the young person on his/her own (Sanci and Young 1995; Blair and Bowes 1995; Goldenring and Cohen 1988; Sanci and Young 1995; Roter and Hall 1994)</td>
<td></td>
</tr>
<tr>
<td>Emphasise confidentiality (Sanci and Young 1995; National Health and Medical Research Council 1997; Blair and Bowes 1995)</td>
<td></td>
</tr>
<tr>
<td>Use clear communication and test comprehension (Press and Khan 1997; Keinhorst 1995; National Health and Medical Research Council 1997; Friedman and Litt 1986)</td>
<td></td>
</tr>
<tr>
<td>Adopt an empathic and non-authoritarian manner (Press and Khan 1997; Lartigue and Lartigue 1990)</td>
<td></td>
</tr>
<tr>
<td>Set clear, short term therapeutic goals (Blair and Bowes 1995; Friedman and Litt 1986)</td>
<td></td>
</tr>
<tr>
<td>Involve the young person in developing the treatment plan (Blair and Bowes 1995; National Health and Medical Research Council 1997)</td>
<td></td>
</tr>
<tr>
<td>Use family/friends to reinforce treatment programme as appropriate (Blair and Bowes 1995; Tefibi 1993)</td>
<td></td>
</tr>
<tr>
<td>Allow sufficient time for consultation (National Health and Medical Research Council 1997)</td>
<td></td>
</tr>
<tr>
<td>Maintain follow-up (Blair and Bowes 1995)</td>
<td></td>
</tr>
</tbody>
</table>

(No p values)

Table 28.  Assessment of the risk of suicide for a young person (largely based on overseas expert opinion, level V evidence)

<table>
<thead>
<tr>
<th>Maintenance of a high index of suspicion and background awareness of which groups of young people are at highest risk of suicidal behaviour</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Current thoughts of suicide (Have you thought about harming yourself?)</td>
<td></td>
</tr>
<tr>
<td>Suicide plan and method (Have you planned how you will kill yourself? (What is your plan?)</td>
<td></td>
</tr>
<tr>
<td>Availability (Do you have access to the means to kill yourself? (Do you own a firearm?)</td>
<td></td>
</tr>
<tr>
<td>Rescue (Would you try and kill yourself with others nearby or by yourself?)</td>
<td></td>
</tr>
<tr>
<td>Precipitating stressful event (Has something happened recently that made you very sad or upset?)</td>
<td></td>
</tr>
<tr>
<td>Previous attempts (Have you ever tried, or threatened, to kill yourself before?)</td>
<td></td>
</tr>
<tr>
<td>Details of the lethality of previous attempt (How did you plan to kill yourself last time? Was anyone nearby? Did you intend to die? Did your last attempt change the way you felt? Tell me about it)</td>
<td></td>
</tr>
<tr>
<td>General past medical, psychiatric, and psychosocial history</td>
<td></td>
</tr>
<tr>
<td>Particular reference to alcohol and drug use (Do you use alcohol and other drugs? How often? How much each time?)</td>
<td></td>
</tr>
<tr>
<td>Particular reference to social supports (Is there someone who cares about you and what you are experiencing?)</td>
<td></td>
</tr>
<tr>
<td>Perform a mental status examination- Specifically ask about any loss of hope (Do you have any hope that your life will get better?)</td>
<td></td>
</tr>
</tbody>
</table>

(No p values)
A number of steps have been found to be critical in the management of suicidal young people in primary care settings (adapted from National Health and Medical Research Council 1997).

ADEQUATE TRAINING AND REFERRAL LINKS

It is a preliminary requirement that practitioners are adequately trained to manage suicidal young people and that they also regularly update their skills. In addition the practitioner should be aware of, and have contact with, a number of referral organisations specific to the ongoing health needs of adolescents (Rittner et al. 1995).

ENGAGE THE YOUNG PERSON IN A THERAPEUTIC RELATIONSHIP

Regardless of whether the person will be referred on for more definitive management, or not, it is important to ensure that the young person’s initial experiences with a health professional in relation to their mental health illness are conducted in the context of a warm and empathic relationship. It is important for the patient to be listened to and to receive some support from the practitioner in relation to their often very stressful situation. It is also important to provide the young adult with some reassurance that the practitioner will try to assist them.

MAKE AN EFFECTIVE CLINICAL ASSESSMENT

An expert opinion article by Press and Khan (1997) presents a useful overview of the assessment of a potentially suicidal adolescent. The article describes the evaluation of the patient with the assistance of the mnemonic MALPRACTICE. This evaluation should include an assessment of the mental status of the patient, a history of past attempts, a description of the lethality of the attempts, whether the patient has positive or negative plans for the future, description of whether the patient is involved in risk taking behaviours specifically their use of alcohol and drugs, question whether there was any recent conflict or past trauma associated with abuse. Assessment of impulsivity, community supports and the patient’s exposure to family or peer suicide complete the assessment plan presented by Press and Khan from information gathered from the patient and their significant friends and family.

DECIDE IF HOSPITALISATION OR REFERRAL IS NEEDED

If suicide risk is high admission is necessary or at least referral to an emergency department of a hospital is indicated. If the patient is not admitted it is usually important to arrange for a review, or at least to consult by telephone, with an appropriate mental health care professional, usually a psychiatrist. Absolute criteria for admission include the need for medical management of an attempt (e.g. administration of N-acetylcysteine for paracetamol poisoning), psychiatric management (e.g. psychosis or persisting suicidal intent) and psychosocial support (e.g. no suitable caregivers available) (Trautman and Shaffer 1989). The practitioner will need to consider committal if he/she considers that suicide risk is high but the young person refuses treatment. Several authors have formulated useful acronyms that describe the risk factors for suicide and which can provide a framework for any decision about admission. Hofmann and Dubovsky (1991) describes the use of SAD PERSONS to assist the clinician to consider the following risk factors when considering whether to admit a patient:

- risk factor
- sex (male)
- age (youth); the scale was intended for all ages
- depression
- previous attempts
- ethanol (or other substance abuse)
- rational thinking loss
- social supports lacking
- organised plan to commit suicide
- no spouse
- sickness any major medical or psychiatric illness.

Hofmann and Dubovsky (1991) emphasises that the tool is only an aide de memoire to consider some of the risk factors for suicide and does not present a definitive checklist, and notes that it is usually prudent to err on the side of caution and admit a patient whenever in any doubt. Similar mnemonics exist for evaluating depression and substance abuse and it is mandatory to consider these diagnoses in patients who are being evaluated for their suicide risk (Buzan and Weissberg 1992).
Based on the available literature, referral to hospital for possible inpatient care is indicated in many situations, including the following:

- When the young person represents a serious threat to themselves (National Health and Medical Research Council 1997) and/or when they require basic care and support that is unavailable at home or in the community (National Health and Medical Research Council 1997).
- When it is appropriate to temporarily remove the young person from a stressful situation (National Health and Medical Research Council 1997).
- When treatment is unavailable in an outpatient setting or when that treatment is not effective (National Health and Medical Research Council 1997).
- Non-medically qualified primary care providers may always wish to consider referral, particularly if an underlying mental or medical illness is apparent.

Referral should be based on an assessment of the person’s suicide risk and an assessment of the person’s coping and problem solving abilities, including their ability to abstain from suicide, their ability to express their feelings and use any available support people and finally their willingness to call on therapeutic services (Blumenthal 1990b).

Rather than considering criteria for admission it may be more appropriate to consider what criteria should be met before a patient is allowed to go home, these criteria include (Buzan and Weissberg 1992):

1. suicidal intent is not present
2. medically stable
3. patient will return before harming himself if suicidal ideas resurface
4. patient is not intoxicated, delirious, or psychotic
5. firearms have been removed
6. acute crisis has been in some way resolved
7. treatment for an underlying psychiatric illness has been resolved
8. physician believes that the patient will attend treatment
9. social supports have been mobilised.

Some authors have attempted to provide a guide to management based on key features of the clinical assessment of each patient (See Table 29).

**SELECT AN APPROPRIATE TREATMENT(S)**

The next section considers the primary care based treatment of young people at risk of suicidal behaviour. In addition to the provision of treatment, the primary care practitioner is also concerned with the support of family members and peers constantly monitoring progress, and making further referrals as necessary. Finally, the practitioner is able to assist the patient to ideally return to full functioning (National Health and Medical Research Council 1997). Additional considerations would be to:

- support family members and peers
- monitor progress
- arrange further referrals as needed
- assist patient with return to full functioning

**PROVIDE SAFETY FOR THE YOUNG ADULT**

The key points include:

- enlist the assistance of their the family and friends
- remove firearms and means to harm themselves
- arrange close supervision and support from appropriate member of friends/family
- consider negotiating a no suicide contract
- arrange follow-up and provide the young adult, and their support person(s), with a written crisis plan listing additional services (professional and patient based) that are available 24 hrs a day
- follow-up on progress should be maintained by the GP and communication between any health professionals involved in the care of a suicidal patient can be vitally important
- frequent visits will be needed to check on progress, support the patient and coordinate the involvement of other professionals as appropriate
Table 29. Taxonomy of risk and related management (based on: Atala and Baxter 1989)

<table>
<thead>
<tr>
<th>Level of risk</th>
<th>Suicidal behaviour</th>
<th>Clinical mental illness</th>
<th>Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>Suicidal ideation, no intent</td>
<td>Not present</td>
<td>Follow-up by GP</td>
</tr>
<tr>
<td>Moderate</td>
<td>Ideation, vague plan and no means to undertaken plan</td>
<td>Present</td>
<td>Psychiatric referral and follow-up in meantime</td>
</tr>
<tr>
<td>High</td>
<td>Intent often +plan often with means to complete plan</td>
<td>Present and often recent crisis</td>
<td>Hospitalise</td>
</tr>
</tbody>
</table>

(No p values)

Any assessment of risk, however, requires frequent re-evaluation, particularly amongst adolescents (Atala and Baxter 1989).

Table 30. Summary of the key steps in the management of the suicidal young person.

<table>
<thead>
<tr>
<th>Summary: Key steps in the management of the suicidal young person in primary care</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ensure adequate background training and referral links</td>
</tr>
<tr>
<td>Engage the young person in a therapeutic relationship</td>
</tr>
<tr>
<td>Provide safety for the young adult</td>
</tr>
<tr>
<td>Make an effective clinical assessment</td>
</tr>
<tr>
<td>Decide if hospitalisation or referral is needed</td>
</tr>
<tr>
<td>Select an appropriate treatment(s)</td>
</tr>
<tr>
<td>Support family members and peers</td>
</tr>
<tr>
<td>Monitor progress</td>
</tr>
<tr>
<td>Arrange further referrals as needed</td>
</tr>
<tr>
<td>Assist patient with return to full functioning</td>
</tr>
</tbody>
</table>

(No p values)
Primary care based treatment of suicidal young people

**POPULATION-BASED PREVENTION OF SUICIDE AMONG YOUNG PEOPLE**

Population-based prevention is concerned with decreasing the rate of occurrence of new cases of suicidal behaviour and is directed at the entire population of young people. These interventions therefore seek to alter the non-suicidal person’s attitude towards suicide, and involve the early identification and treatment of conditions known to predispose to suicidal behaviour.

Population-based prevention typically involves public health programmes that use the tools of health education, health promotion and health protection (Shaffer et al. 1988). These programmes usually have as their main strategy an attempt to improve mental health amongst adolescents. Most of these programmes have been based in schools and most have the following goals:

- to heighten awareness of suicide
- to promote case finding among peers by presenting descriptions of warning signs and avenues for seeking assistance
- to give staff and students information about mental health resources
- to improve adolescents coping ability and focus on maintaining psychological good health.

**ROLE OF THE GP IN SCHOOL-BASED PREVENTION PROGRAMMES**

School-based prevention programmes are common in the United States (Garland et al. 1989), Australia (Hazell and King 1996) and increasingly in New Zealand (Disley and Coggan 1996b). These programmes involve the delivery of general information to students about improving mental wellbeing and the provision of specific information about the development of suicidal behaviour among young people and warning signs to facilitate the identification of potentially suicidal peers. In the literature family physicians have sometimes been involved in either delivering a component of these programmes, acting as a resource for youth or providing for youth a point of referral for any adolescents who have concerns about their own, or their friends’ mental health e.g. Committee on Adolescence 1994.

Debate exists about the effectiveness of school-based suicide prevention programmes (Gunnell and Frankel 1994). Some authors have championed the school-based programme for its ability to enhance the education and coping skills of young adults, while others have slated them as being well intentioned but misguided, and having a number of deleterious effects on students, such as promoting imitation of suicidal acts (Hazell and King 1996; Gunnell and Frankel 1994). Very few systematic controlled evaluations are available of any school-based programmes, including those that have involved primary care practitioners. Shaffer et al. (1991) and Shaffer et al. (1988) provide rare exceptions. Their evaluation concluded that there was some limited evidence of an improved attitude and awareness of suicidal behaviour, or coping techniques, among the students, however most improvement appeared to be among the students who already subscribed to most of the ideals of the programme. Concerns exist that some of the information in the programmes may be inaccurate and that they adopt a universal approach, which ignores the students who are at highest risk of suicidal behaviours (See Table 31).

A number of studies have examined the effect of suicide prevention programmes in schools, which have been principally delivered by school personnel (See Table 32). These studies include: (Spirito et al. 1988; Orbach and Bar-Joseph 1993b; Abbey et al. 1989; Kalafat and Elias 1994; Nelson 1987; Overhosler et al. 1989; Zenere and Lazarus 1997; Eggert et al. 1995; Shaffer et al. 1990a; Ciffone 1993; Vieland et al. 1991; Klingman and Hochdorf 1993). Generally this research has not found any consistent improvement in the attitudes of young people related to suicide. Some studies have found that suicide programmes increase the sense of hopelessness among students (Overhosler et al. 1989) or foster acceptance by students that suicide is a valid solution to problems (Shaffer et al. 1990a). Significantly only very few of the studies have assessed the actual effect of the intervention on suicidal behaviour. Zenere and Lazarus (1997) used a longitudinal design, and found that the number of reported suicide attempts among pupils in a large school system in the United States reduced after the introduction of a school prevention programme. However, this study had several major limitations including no control group, and little ability to exclude bias or confounding as alternative explanations for their result. The other two studies that have assessed the effect of a school-based programme on suicidal behaviour found that exposure to the programme resulted in no significant difference in the incidence of suicide at-
tempts. The few that have evaluated the effect of the programme on suicidal ideation have recorded mixed results.

Vieland et al. (1991) found no difference in the incidence of reported suicide attempts before and after the delivery of a suicide prevention programme in 174 students exposed to the programme compared to 207 controls. The study was set in 4 schools in New York (USA) and follow-up was undertaken over an 18 month period. Orbach and Bar-Joseph (1993a) found that pupils exposed to a school-based programme exhibited reduced scores on a scale that indicated their suicide potential compared to controls. By contrast Eggert et al. (1995) found that the provision of a school-based programme did not improve their suicidal ideation in comparison with a control group. Finally Shaffer et al. (1990b) found among a small number of students that being exposed to the programme made their suicidal ideation worse.

In addition, it is notable that most school-based prevention programmes have used a stress model to explain suicidal behaviour among young people, and have therefore ignored the overwhelming evidence emphasising the role of mental illness as an important underlying risk factor (see Section B) (Mazza 1997).

In conclusion, it appears that there is currently no evidence to suggest that school-based programmes can reduce suicide among young adults (Ploeg et al. 1996). Surprisingly few studies have evaluated the effect of school-based programmes on suicidal behaviour and none have undertaken a long-term assessment of the effectiveness of a programme.

A correlational study by Lester (1992a) found that states in the US with more school-based programmes did not have lower suicide rates. Despite the uncertainty that these programmes are generally effective at reducing suicidal behaviour, some have been reported as being successful at improving mental well-being. These programmes have been identified as usually including those that have close links to community based health professionals and those that address a number of goals and utilise a number of strategies (O’Carroll and Potter 1994; Dryfoos 1991).

Kazdin (1993) and Shaffer et al. (1991) have proposed an alternative approach for school-based programmes that is based on targeting the specific needs of high-risk groups and/or the high-risk behaviours of adolescents. Two interventions involved health professionals, Pedro-Carroll and Cowen (1985) involved mental health professionals while Pless et al. (1994) used primary care nurses. These studies and a selected number of other programmes that have targeted high-risk groups or behaviours are presented in Table 33.

It is notable that these studies do not include a placebo control group and therefore the absolute effectiveness of the interventions is unknown. In conclusion, there is insufficient evidence to recommend universal school-based, suicide prevention programmes except where they have involved health professionals and have been based on a number of strategies, or when they have been applied to high-risk groups and/or high-risk behaviours. Several recent reviews have presented similar conclusions (Tilford et al. 1997; National Health and Medical Research Council 1997; Anonymous 1997).

**LOBBYING FOR A RESTRICTION OF ACCESS TO MEANS OF SUICIDE AND THE RESPONSIBLE REPORTING OF SUICIDE IN THE MEDIA**

Others areas of primary prevention that have been presented in the literature as important issues for advocacy by primary care professionals are the restriction of the means of suicide (especially firearms) within the community and the responsible reporting of suicide events in the media (Low and Andrews 1990). Several experts have cited that a restriction of the access to the means of suicide could significantly reduce youth suicide (Shaffer et al. 1988; Garland and Zigler 1993b; Centre for Disease Control 1988). Despite this assertion no studies have actually evaluated the effect of the introduction of restrictions on the access to means of self-harm on actual suicide rates (Beautrais 1998). Several cross sectional or ecological studies have compared differences in suicide rates with regard to geographical or historical changes in the access to the means of suicide. The findings from these studies have presented conflicting results, with some suggesting that areas that have tighter restrictions on the access to means of suicide have reduced suicide rates e.g. Marzuk et al. (1992), Kellerman et al. (1992). Other studies have found that there have been no differences in suicide rates between areas with differing access to particular means of suicide, because alternative methods of suicide have increased to offset any potential benefits from the restriction (Rich et al. 1990).

It should be noted that most of the literature has been based in the United States and has been concerned with access to firearms. Restriction of firearms would have an uncertain effect on suicide prevention in New Zealand, as firearms are not as prevalent in this country compared to the United States and firearms are used less frequently for suicide (Beautrais et al. 1996a). Despite the likelihood that the restriction of firearms in this country may be associated with only a modest reduction in the rate of suicide, it seems prudent to ensure that the access to firearms in...
this country is maintained at a low level. In addition, other restrictions on alternative methods of suicide would also seem appropriate to prevent any substitution of the means of suicide (Australian Institute for Suicide Research and Prevention 1996). For example, access to known suicide spots should be prohibited in existing tall structures or planners should incorporate adequate barriers in designs for new high buildings (Australian Institute for Suicide Research and Prevention 1996). The prescribing of lower amounts of (preferably) less toxic medication should also be promoted, and any potentially lethal medication should have restricted access across the counter without prescription (Australian Institute for Suicide Research and Prevention 1996; Beautrais 1998). Finally, improvements could be made in both institutional design and personnel training to reduce the possibilities of hanging by inmates in both health and correctional facilities (Australian Institute for Suicide Research and Prevention 1996).

The effects of encouraging the media to adopt more responsible reporting could be effective at reducing suicidal behaviour, although the evidence, or the effectiveness of this intervention, is primarily based on quasi experimental and descriptive studies along with the opinions of experts (Lester 1992b; Gunnell and Frankel 1994; Schmidtke and Hafner 1988).

OFFICE BASED PREVENTIVE HEALTH CARE

The US and Canadian Preventive Services Taskforces have both recommended that adolescents should have one or two consultations with a GP for preventive health care. These consultations were intended to enable the identification and subsequent management of any significant risk factors for ill health. Although the Taskforces did not specifically include the identification of risk factors for suicidal behaviour e.g. substance abuse, depression, these visits have been suggested as an ideal opportunity to undertake this task (Gilchrist 1991; Allen 1994). Interventions to manage these risk factors could then be either provided or arranged by the primary care practitioner.

THE PROVISION OF YOUTH HEALTH CLINICS STAFFED BY PRIMARY CARE PRACTITIONERS

A number of papers have described the provision of youth health clinics. These clinics have often been set up in schools and a number have been staffed by general practitioners or practice nurses. It has been suggested that youth health clinics based in schools may have an important role in preventing adolescent suicide by improving access to health care for young adults, especially among young people with serious risk factors for suicide (specifically depression or substance abuse). In addition it has been proposed that school health clinics can assist with integrating primary care professionals into school settings and have enabled them to participate in school-based prevention programmes. Most of published research that has considered school health clinics have been descriptive studies detailing the development of a clinic e.g. McClowry et al. (1996) or identifying the type of clients that have attended the facility e.g. Chavasse et al. (1995). One study examined the potential of the school-based clinic to identify young adults at risk of suicide, however this study was also only descriptive and relied upon an application of the Suicide Probability Scale to assess the risk of suicide among the attenders. Some doubt exists about the validity of this scale particularly in relation to its application to community-based groups of adolescents. Consequently, the study was not able to assess the effectiveness of the clinic at accurately identifying which young adults were actually most likely to be at risk (Cappelli et al. 1995). Another descriptive study based its conclusion that school health clinics were able to increase the access of young people with mental illnesses to primary care on the basis of the reported attendance of the adolescents to a clinic if one existed (Riggs and Cheng 1988). Clearly the reported willingness to use a clinic is synonymous with the actual utilisation of a medical centre. Although some opinion articles e.g. Kendall and Peterson (1996) suggest that adolescent health clinics (either based in schools or not) have been successful at improving the mental health of young adults, and specifically at reducing suicide among young adults, no formal evaluations have been found that have quantitatively examined the efficacy of these clinics (either staffed by primary care professionals or others) to reduce suicidal behaviour among young people.

THE EDUCATION OF GPS TO IMPROVE THEIR RECOGNITION OF YOUNG PEOPLE AT RISK

Although not solely based on young people, considerable interest has been attached to the evaluation of a programme that was primarily aimed at improving GP-based care of mental illness. The quasi-experimental study on the island of Gotland (Sweden) reported that the rate of suicide was reduced after the introduction of training programmes for GPs in the recognition and management of depression (Rihmer et al. 1995; Rutz et al. 1989). The reduction in suicide rates was accompanied by an improvement in other indicators of quality of care (such as decreased hospital admissions and improved prescribing) and a saving in drug and hospital care costs,
which far outweighed the cost of the programme (Rutz et al. 1992a). However, the effect of the education programme was found to attenuate, such that three years after the project had ended the amount of in-patient care for depressive disorders increased, the suicide rate returned to almost baseline levels and the prescription of psychoactive medication stabilised (Rutz et al. 1992b). Rutz et al. (1992b) suggested that after two years a significant proportion of the GP workforce in the area had changed and these new practitioners had not been exposed to the programme. In addition, many of the remaining GPs might have forgotten the information presented to them in previous educational programmes.

Some caution must be exercised with the author’s conclusions from their evaluation of the Gotland programmes. The Gotland studies used an essentially retrospective longitudinal, cross-sectional study design which is prone to significant methodological deficiencies particularly in relation to its limited ability to determine causality, largely as a result of its inherent inability to adequately eliminate bias or confounding as possible explanations for any associations. The Gotland studies also lacked a control group. Consequently, it is unclear as to what extent the improved outcomes can be reliably attributed to the educational campaign. It has been recognised, for example, that administrative changes in the data may have contributed to the findings (Van Knorring 1991) or changes in socioeconomic status among the population (Ferrada-Noli 1997). Further support for the influence of these other factors on the outcome from the study comes from the analysis by MacDonald (1993) who noted that prior to the GP educational programme there was already a trend for suicide rates in Gotland to be decreasing.

Some reservations about the quality of some of the information that is available and the potential for negative or even harmful advice that could be given by participants in electronic discussion groups. Stoney also points out that issues such as whether confidentiality should be respected or how the groups can avoid hoax messages have also not been satisfactorily answered.

Baume et al. (1997) has also expressed concern that the Internet may present a new forum for the public communication of suicide that may increase the likelihood of imitation events among vulnerable young people. Baume et al. (1997) presented two case histories that both suggested that interactive suicide notes on the Internet may have been influential in the suicidal death of two young people. Although no actual research has yet been undertaken on the role of the Internet in relation to suicide imitation or prevention, this medium remains of considerable potential importance for young people who have been shown to be the most frequent group to access cyberspace (Anonymous 1996b).

Another novel use of computer based technology directed at young people was presented by (Horan 1996). Horan (1996) assessed the use of computers to assist young people with the improvement of their self-esteem. Although this study did not assess suicidality and was not based in a clinical setting, it does provide an interesting and innovative example of the application of new technology. The trial was a randomised comparison of 56 young people allocated to receive interactive computer cognitive restructuring (intervention group) or relaxation exercises (control group). After one week, various measurements of self-esteem were significantly higher among the intervention group.

**THE INTERNET AND COMPUTER BASED TOOLS TO PREVENT SUICIDE AMONG YOUNG PEOPLE**

The exhaustive array of information on the Internet coupled with increasing interest and access to computers for many adolescents presents an important potential tool for assisting with suicide prevention among young people.

Stoney (1998) has described the suicide prevention resources available on the Internet, including those related to web pages, electronic mail and usenet news groups, along with the mailing lists that specifically address suicide among youth. Apart from providing information, young people can also potentially gain valuable support and contact with their peers, particularly with others who are experiencing similar difficulties. Stoney, however, expresses a number of reservations about the quality of some of the information that is available and the potential for negative or even harmful advice that could be given by participants in electronic discussion groups. Stoney also points out that issues such as whether confidentiality should be respected or how the groups can avoid hoax messages have also not been satisfactorily answered.

**TREATMENTS TARGETED AT YOUNG PEOPLE AT HIGH-RISK OF SUICIDAL BEHAVIOUR**

Targeted treatments include those interventions that will reduce the potential for suicide among young adults who have significant risk factors, including those individuals who have already made a suicide attempt and those people who have expressed significant suicidal ideation (Shaffer et al. 1988). Some population-based interventions could also be targeted interventions; for example the restriction of access to the means of suicide.

Two general types of treatment for suicidal behaviour have been described in the literature: psychological or psychosocial treatments, and pharmacological therapies. Often the two modalities are used in combination.
Generally, there is very limited evidence about the effectiveness of either of these treatments in relation to preventing suicide among young people. Ideally the effectiveness of an intervention should have been demonstrated by large well-conducted randomised controlled trials, however there is very little of this level of evidence available with regard to the prevention of suicide among adolescents. Among the few randomised-controlled trials that have been carried out there have been significant limitations associated with the rigour of the research. For example, in one of the few studies that found a positive result for the effectiveness of pharmacological treatment among adolescents to prevent suicide (Emslie et al. 1997), it is notable that only 96 patients were enrolled in the study and the duration of follow-up was limited to only 8 weeks. Furthermore, despite the short duration of the trial there was significant attrition from the study, 36 out of 96 patients failed to complete the study.

**PREVENTION OF SUICIDE BY COGNITIVE BEHAVIOURAL THERAPY**

Cognitive behavioural therapy (CBT) typically involves multiple components and is based on the theory that some people have learned to interpret events negatively (Clarke et al. 1993). Typically CBT involves teaching a young person to: monitor their thoughts, evaluate these thoughts and restructure them into helpful, positive ways of thinking. The adolescent is then taught to reinforce these new cognitive patterns and facilitated to devise a pattern of relaxation and participation in pleasurable activities to deal with their stress. Interpersonal issues are also addressed and patients are provided with social skills training (Clarke et al. 1993; National Health and Medical Research Council 1997).

While several small controlled trials have reported favourable results for the use of CBT among adult suicide attempters e.g. Linehan et al. (1991), Salkovskis et al. (1990), Blackburn et al. (1981), no studies have specifically examined the effectiveness of CBT at reducing suicidal behaviour among adolescents. Although one paper described the use of CBT in 100 adolescent attempters, the study did not include any description of the outcome for the patients and therefore failed to evaluate the effectiveness of the treatment (Rotheram-Borus et al. 1994). By contrast, a number of studies have evaluated the use of CBT in the treatment of depression among young people. Generally, these studies have found that CBT was effective at treating depression among young people.

CBT has a number of significant disadvantages. It is associated with a considerable time commitment; initially for professionals to learn the technique and then for both practitioners and patients to undertake the treatment. The treatment would be expensive for adolescents attending a fee-for-service primary care centre. Finally, the rapport established by the therapist, and the relationship between the practitioner and patient, would be very important in determining the outcome of treatment.

A variation of cognitive behavioural therapy, dialectic behavioural therapy (DBT) has been developed for use with patients with borderline personality disorder and has been subjected to one small randomised controlled trial with a favourable result (Linehan et al. 1991). The therapy is based on a positive and validating attitude to patients with borderline personality disorder and involves a clearly structured treatment programme that includes a clear hierarchy of targets. DBT utilises a variety of methods (including pharmacotherapy, group counselling and individual psychotherapy) in a treatment that is underpinned by dialectical philosophy that assists the patient to understand their problems and provides them with skill based training to overcome their difficulties (See Table 35). Although this treatment appears promising for a group of patients that can be difficult to engage in therapy, the results of further trials (involving larger sample sizes and based in different treatment settings) are needed to establish the efficacy of this intervention.

**FAMILY THERAPY**

Family therapy in the treatment of suicidal adolescents is based on the assumption that the suicidal behaviour of the young person is actually a symptom of familial dysfunction (Kerfoot et al. 1995; Kerfoot et al. 1997). Treatment therefore is aimed at improving family interaction and communication (Kerfoot et al. 1995). Alternative problem solving tools are often also presented to the family unit to enable them to respond more constructively to stressful situations in the future (Kerfoot et al. 1997). Family therapy does not have a single methodology but can involve a number of different approaches (See Table 36).

Only one controlled trial was found that evaluated the provision of family therapy in a primary care setting. The trial by Harrington et al. (1998) found that family therapy provided by a social worker in a patient’s home was ineffective at reducing suicidal ideation among young people (aged 13-16 years). The trial did not assess the effect of the intervention on actual suicidal behaviour.

No other controlled trials have been undertaken on primary care based, family therapy among adolescents at serious risk of suicide behaviour, although it...
GROUP SUPPORT

Family dysfunction has been found to be a significant risk factor for suicidal behaviours and it seems intuitively rational to assume that treatment of the family could reduce the incidence of suicide in young people, although empirical evidence to support this is awaited.

A randomised controlled trial has been undertaken of family therapy, cognitive behavioural therapy and supportive therapy among adolescents referred to an outpatient unit for treatment of their depression (Brent et al. 1997). The study found that cognitive behavioural therapy was the most efficacious treatment for depression while all three treatments were equally effective at reducing scores on a suicide prediction scale (CBT vs individual non-directive supportive therapy p=0.02, NNT=4 over 16 weeks; CBT vs systemic behaviour family therapy p=0.03 and NNT=6.6 over 16 weeks). However, the study was small and the evaluation was undertaken after a short period of follow-up (12-16 weeks), in addition there were significant differences between the study groups at the beginning of the trial which suggested that the randomisation process may have been inadequate.

Family therapy has several disadvantages. The treatment relies upon the ability of the therapist to engage the family and is likely to have limited benefit if some family members were unwilling to participate (National Health and Medical Research Council 1997). Family therapy can be expensive which may be a significant barrier for disadvantaged families (Kerfoot et al. 1997).

PSYCHOANALYSIS

Psychoanalytical treatment involves assisting the young person to act out often unconscious conflict(s) within the therapeutic relationship (Katz 1995; Anonymous 1996a). No controlled trials have been undertaken of the provision of psychoanalytical treatment. Several reviews have suggested that psychoanalysis is an inappropriate treatment for most adolescents, owing to the need for a long duration of treatment and the intense introspection required for the therapy (Anonymous 1996a; Blumenthal 1990b).

OUTPATIENT-BASED CRISIS INTERVENTION

Two small studies have considered the outpatient management of adolescents with suicidal behaviour by means of short, crisis orientated therapy which focuses on patient problem solving in relation to the stressful event(s) that may have precipitated the suicide attempt. Crisis therapy emphasises the role of the stressful events and suicidal behaviour as a crucible for change. Proponents suggest that the intense emotions and interest of the patient and his/her family and friends surrounding the suicidal attempt can be harnessed to change the patient’s attitude or behaviour along with that of the members of their social milieu in order to improve their wellbeing. The aim of crisis therapy is to decrease lethality in an individual by decreasing the felt perturbation, that is when the person’s unbearable problems or injustices are settled they will reconsider suicide (Leenars 1994; quoted in Keinhorst 1995). Unfortunately most research evaluating this approach has included only small, descriptive studies that have lacked both a control group and sufficient size to enable any firm conclusions about the effectiveness of the technique e.g. Gutstein and Rudd (1990), Robinson (1984). A before and after study by Greenfield et al. (1995) found that the provision of a crisis intervention service reduced the rate of subsequent hospitalisations without any other adverse outcomes, although the study could not exclude that some other change in practice behaviour, or case mix, may have accounted for the change. The single randomised trial that has compared outpatient crisis oriented short term treatment with traditional in-patient care has been limited by a number of significant flaws (small size, high attrition rate, limited generalisability- see section on outpatient vs in-patient care). Problem solving training per se has not been shown to be effective at preventing suicidal behaviour among adolescents, however, in the crisis situation it is presumed that change can occur (McLeavey et al. 1994).

PHARMACOTHERAPY

The direct effect of pharmacotherapy on suicidal behaviour

Studies of the effect of pharmacotherapy on suicidal behaviour are largely confined to research that has examined the relationship between selective serotonin re-uptake inhibitors (SSRIs) and suicidal behaviour.

Given the reports of altered serotonin levels in the brain and CSF of suicide victims (See Section B) there has been considerable hope that SSRI may have a significant effect on suicidal behaviour. In addition,
the relative safety of fluoxetine in overdose (especially in comparison with tricyclic antidepressants) has added to the interest in using this medication to treat suicidal adolescents (Carrey et al. 1996; Greenhill and Setterberg 1993; National Health and Medical Research Council 1997). However, clinical trials evaluating the efficacy of this medication among either adult or adolescent populations have found mixed results. While some research has found that fluoxetine has failed to reduce the rate of further attempts in a group of depressed adults who have made suicide attempts (Montgomery et al. 1994), another descriptive study by King et al. (1991) reported an increase in suicidal behaviour among young people in relation to the use of fluoxetine. A recent meta-analysis which assessed the effect of fluoxetine on suicidality concluded that neither suicidal behaviour nor ideation were increased by the administration of the SSRI, and although there was a significant reduction in ideation there was no statistically significant effect on suicidal acts and attempts (Beasley et al. 1991). It is notable that the meta-analysis only included one trial (out of a total of 17 studies) that was solely based on young people (Simeon et al. 1990) (this small trial of 40 patients found no significant difference in suicidal acts between study groups over 4 years follow-up). Finally, despite the use of pooled data the meta-analysis probably had inadequate power to assess the impact of the medication on suicide deaths and attempts.

Studies that have examined the effectiveness of young people of pharmacotherapy on psychiatric conditions closely associated with suicide

Tricyclic antidepressants (TCAs)

To date, double blind randomised controlled trials of tricyclic antidepressants for adolescents have failed to find any significant benefit over placebo in the treatment of depression even when plasma levels have been monitored (Geller et al. 1990; Boulou et al. 1991; Kutcher et al. 1994). A recent meta-analysis that combined the results of 12 randomised-controlled trials concluded that there was no significant difference between TCAs and placebo in the treatment of adolescent depression (Hazell et al. 1995). This finding is in marked contrast to the proven efficacy of the medication in the adult population (Kutcher et al. 1994). The discrepancy between adults and adolescents may be due to biological differences between the populations or inadequacies in the design of studies that have assessed the use of the medication in the younger age group. It is notable that the study by Kutcher et al. (1994) only included a small number of subjects. Despite this, the trial was also subject to an unusually high rate of withdrawal (nearly one third of the participants did not complete the six weeks of treatment). Many of these patients withdrew because of side effects from the medication. Although no clear benefit has been found with the use of tricyclic medication, several significant adverse effects among adolescents have been recognised with the use of the drug, including cardiotoxic effects and the marked toxicity of the drug in overdose. Several authors have cautioned that careful consideration should be made before a tricyclic is prescribed to treat an adolescent’s depression (National Health and Medical Research Council 1997; Greenhill and Waslick 1997, Carrey et al. 1996).

Mono-Amine Oxidase Inhibitors (MAOIs)

No randomised-controlled trials have specifically assessed the effectiveness of MAOIs for the treatment of depression among young people (National Health and Medical Research Council 1997; Greenhill and Setterberg 1993). This potential for this medication to cause serious side effects when used in combination with tyramine-containing foods has limited the use of the medication in young adults (Carrey et al. 1996).

Selective Serotonin Re-uptake Inhibitors (SSRIs)

Emslie et al. (1997) has found in a recent randomised controlled trial involving 96 patients between 6-18 years that fluoxetine (an SSRI) was superior to placebo in the treatment of depression. By contrast an earlier, and smaller trial (n=40), by Simeon et al. (1990) failed to find evidence for the efficacy of fluoxetine in young people aged 13-18 years. Fluoxetine has been associated with fewer significant side effects than TCAs (National Health and Medical Research Council 1997; Carrey et al. 1996).

Although definitive evidence is not yet available that SSRIs are effective at treating depression in young people (unlike adults where substantial evidence has been accumulated) the medication does appear to be potentially effective (National Health and Medical Research Council 1997). A large randomised controlled trial is clearly needed to furnish the definitive conclusion.

STUDIES THAT HAVE EXAMINED THE TREATMENT OF DIFFERENT MENTAL ILLNESSES AMONG YOUNG PEOPLE (BASED ON A BRIEF AND LIMITED REVIEW OF THE EVIDENCE)

Mental illness is often the precursor of suicidal behaviour in young people. To be comprehensive this review has included a brief overview of the effectiveness of various treatments for different psycho-
pathologies among young people. There is a pressing need for a detailed review to be undertaken of the effectiveness of various treatments for different psychiatric conditions among young people.

**Conduct/antisocial disorders**

In general there is a serious lack of research investigating the treatment of conduct/antisocial disorders among adolescents (Stevens and Raftery 1997). This dearth of research is disappointing given the known association of this condition with poor outcomes (Stevens and Raftery 1997). The results of a recent trial have suggested that problem solving skills training may offer the most beneficial effects (Kazdin et al. 1992). Medication, except for the possible exception of lithium when used in in-patient settings, has generally been found to be of limited value (Alessi et al. 1994; Stevens and Raftery 1997).

**Post traumatic stress disorder**

No controlled trials have been identified but a number of descriptive articles have identified the need for a rapid, supportive response to young people with this disorder (Stevens and Raftery 1997).

**Anorexia nervosa and bulimia**

A variety of treatment approaches have been described in the literature for the treatment of eating disorders in young people, however little evidence is available from well designed trials as to the effectiveness of these interventions (Stevens and Raftery 1997). Several review articles have emphasised treatment based on a combination of psychotherapy, nutritional management and medication e.g. McCallum (1993).

**Anxiety disorders and obsessive compulsive disorders**

A number of reviews have emphasised the use of cognitive behavioural therapies as frontline treatment for anxiety disorders, with medication reserved for short term treatment or utilised in those young people who have more refractory problems (Carrey et al. 1996; King and Tong 1992). There is a general lack of evidence from controlled trials to attest to the efficacy of this approach (Lucas 1993). Concern exists about the abuse potential of the medications that have typically been used to treat anxiety (particularly benzodiazepines), several authors have advised that these medications are best used only as a short term treatment option (Carrey et al. 1996; Reiter et al. 1992). Medication (clomipramine) appears to have a greater role in the treatment of OCD (March 1995).

**Psychotic disorders- schizophrenia**

Little research exists to base any definitive conclusions on the effectiveness of treatment to control schizophrenia among young people. Experimental use of anti-psychotics (especially the newer drugs) for young people in the literature mainly consists of a number of open trials and case studies. For example, Simeon et al. (1995) has reported the use of an anti-psychotic in seven cases. A small number of controlled trials consistently support the use of neuroleptics for treating schizophrenia in adolescents (Pool et al. 1976). Concerns exist about the cumulative risk of side effects (such as tardive dyskinesia), and for other adverse effects on psychological and physical development of young people taking this medication over a long period of time (Greenhill and Setterberg 1993; Whitaker and Rao 1992).

Often anti-psychotic medication has been given to adolescents not to treat psychosis but to utilise its sedating effect in order to ameliorate aggressive or violent behaviour (Simeon 1989; Schijano 1991).

**Physical and sexual abuse**

Treatment of the abused young person is very complex. Generally, there is little information available from controlled trials about the effectiveness of specific interventions. Review articles have emphasised the use of psychotherapeutic approaches to treating victims of abuse in order to help the victim deal with any current disorder resulting from the abuse and to prevent future mental illness e.g. O'Donohue and Elliot (1992).

**Substance abuse**

Swadi (1993) has reviewed the treatment of substance abuse among adolescents and concluded that no clear evidence exists for the superiority of any treatment.

**POSTVENTION**

Postvention refers to an intervention that is commenced after a suicide either with family survivors, school pupils or members of the community (Shaffer et al. 1988). The intervention aims to serve as a process where people acquainted with the victim can try and understand why the young person killed themselves and prevent anyone from inappropriately assuming the guilt for the victim’s death (Pallikkathayil and Flood 1991). Importantly the intervention is designed to prevent any further suicidal deaths by imitation (Shaffer et al. 1988). Despite the presentation by a number of organisations e.g. Anonymous (1990), Centre for Disease Control (1988) of guidelines describing in detail the content of postvention...
strategies very little research evidence is available to assess the effectiveness of these strategies. Several authors have presented descriptive studies that suggest that a number of young people have received benefit from these ventures e.g. Brent et al. (1989), Klingman (1989), only a single trial has attempted to evaluate the efficacy of either a composite postvention treatment programme or the individual components of these interventions. The scarcity of published evaluations is at least partly explainable by the methodological difficulties in undertaking this research. Usually a school or community would have no baseline data to enable the comparison between suicidal behaviour before and after the programme. In addition, it is difficult to select a valid control group to assist with the evaluation.

The study by Hazell and Lewin (1993) was an evaluation of a postvention programme delivered to two high schools in New South Wales by two child psychiatrists with the assistance of school staff. The programme was composed of counselling sessions mainly delivered to pupils who had a close friendship with either suicide victim at each of the two schools. The evaluation consisted of a questionnaire enquiring about risk behaviour, proximity to the deceased students and their personal frequency of suicidal ideation or attempts. The study found no significant difference in the rate of suicidal ideation and attempts between 63 pupils who had received counselling and 63 matched controls. Limitations associated with the retrospective design and the small sample prevent any definite conclusions about the efficacy of postvention. However, the lack of any demonstrated benefit from this intervention does challenge the assumption that postvention, or at least one form of the intervention, is an effective method of suicide prevention (Garland et al. 1989; Shaffer et al. 1988).

In conclusion, while a variety of postvention interventions are available, and a number of guidelines exist, few interventions have been evaluated. Despite this lack of evaluation most experts agree that there is a strong need for postvention interventions to prevent further deaths by imitation, and to assist with providing support and counselling to the peers of the victim (Blumenthal 1990a; Centre for Disease Control 1988; Shaffer et al. 1988).

**COMBINATIONS OF TREATMENT**

It is possible that a combination of treatment modalities is the most effective method to reduce suicidal behaviour among adolescents (Brent 1997). Brent has suggested that a combination of therapy for the underlying psychiatric illness, re-mediation of social and problem solving deficits and family psycho-

**Youth suicide prevention by primary healthcare professionals**
Table 31. Evaluations of school-based programmes that have incorporated health professionals

<table>
<thead>
<tr>
<th>Author Country</th>
<th>Study design</th>
<th>Level of evidence</th>
<th>Methodological issues</th>
<th>Sample</th>
<th>Intervention</th>
<th>Results (all statistically significant at p&lt;0.05)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Shaffer et al. 1991)</td>
<td>Cohort</td>
<td>III-1</td>
<td>Short follow-up</td>
<td>758 students in intervention group and 680 matched controls</td>
<td>Programme emphasised clinical features of suicidal youth, problem solving and support for youth</td>
<td>Significantly improved knowledge and attitudes to suicide</td>
</tr>
<tr>
<td>USA</td>
<td></td>
<td></td>
<td>Participants were not randomly allocated</td>
<td>Participation rate &lt;80%</td>
<td></td>
<td>Improved recognition of need to get help for risk behaviours and awareness of where to receive help BUT increased proportion of males indicated after programme that suicide was a valid solution to problems</td>
</tr>
<tr>
<td>(Hazell and Lewin 1993)</td>
<td>Retrospective cohort</td>
<td>III-1</td>
<td>No random allocation</td>
<td>126 received intervention, 63 matched controls</td>
<td></td>
<td>No significant change in risk behaviours, drug and alcohol consumption, ratings on behaviour scale for depression or suicidality</td>
</tr>
</tbody>
</table>
Table 32. The effect of school-based suicide prevention programmes on suicidal behaviour

<table>
<thead>
<tr>
<th>Author Country</th>
<th>Study design</th>
<th>Sample</th>
<th>Methodological issues</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Assessment of impact of programme on suicide attempts</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Vieland et al. 1991) United States</td>
<td>Quasi experimental II-2</td>
<td>174 students compared before and 18 months after exposure to programme with 207 controls</td>
<td>Accuracy and repeatability of questionnaire results questionable</td>
<td>No difference in incidence of suicide attempts (p&gt;0.05)</td>
</tr>
<tr>
<td>(Zenere and Lazarus 1997)</td>
<td>Longitudinal/time series IV</td>
<td>Number of reported attempts in a school system with 330,000 pupils</td>
<td>No control group. Unable to exclude confounding/bias as alternative explanations.</td>
<td>Marked reduction in reported suicidal ideation after introduction of programme (no p value)</td>
</tr>
<tr>
<td>(Shaffer et al. 1990a) United States</td>
<td>Quasi experimental case control II-2</td>
<td>35 exposed suicide attempters compared to 28 non-exposed controls</td>
<td>Accuracy and repeatability of questionnaire results questionable</td>
<td>No difference in the incidence of attempts (p&gt;0.05)</td>
</tr>
<tr>
<td></td>
<td>Impact of programme on suicidal ideation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Orbach and Bar-Joseph 1993a) Israel</td>
<td>Quasi experimental controlled trial II-2</td>
<td>215 adolescents who received programme compared to 178 controls 2 month follow-up</td>
<td>Questionable validity of scale. Short follow-up. Pre-test-post-test design. No assessment of actual behaviour</td>
<td>Students exposed to the programme exhibited reduced scores on a scale assessing suicide potential (p&lt;0.05)</td>
</tr>
<tr>
<td>(Zenere and Lazarus 1997)</td>
<td>Longitudinal/time series IV</td>
<td>Number of reported attempts in a school system with 330,000 pupils</td>
<td>No control group. Unable to exclude confounding/bias as alternative explanations.</td>
<td>Marked reduction in reported suicidal ideation after introduction of programme (no p value)</td>
</tr>
<tr>
<td>(Egert 1994) United States</td>
<td>Quasi experimental controlled trial II-2</td>
<td>105 at risk youth in three groups: 1 received semester programme another, 2 semester, and control 10 month follow-up</td>
<td>Validity of the use of composite scale. Possible Hawthorn effect.</td>
<td>All three groups decreased suicide (behaviour) principally ideation (p&lt;0.05) But there were no significant differences between the 3 groups (p&gt;0.05)</td>
</tr>
<tr>
<td>(Shaffer et al. 1990b)</td>
<td>Quasi experimental case control II-2</td>
<td>35 attempters exposed to programme compared to 524 exposed non-attempters</td>
<td>Repeatability of students' responses was questionable</td>
<td>Significant increase in ideation among attempters and other negative responses to programme by attempters (p&lt;0.05)</td>
</tr>
</tbody>
</table>

Egert assessed the impact of the Programme on “suicide risk behaviours” which included a composite score on a scale assessing both ideation and self reported attempts. As the actual effect on attempts was not explicitly stated the measurement was classified as an assessment of ideation.
Table 33. The effect of school-based, suicide prevention programmes that have targeted high-risk youth

<table>
<thead>
<tr>
<th>Author/Country</th>
<th>Study design</th>
<th>Sample</th>
<th>Intervention</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Programmes to assist children of divorced parents</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Pedro-Carroll and Cowen 1985)</td>
<td>USA</td>
<td>Randomised controlled experiment II-1</td>
<td>Intervention group = 41 children, 34 controls. Short term follow-up</td>
<td>Skills building sessions led by mental health professionals</td>
</tr>
<tr>
<td>(Pless et al. 1994)</td>
<td>United States</td>
<td>Randomised controlled trial II-1</td>
<td>322 adolescents equally assigned to intervention/control groups</td>
<td>Specialised nursing (family support and training in skills + providing referrals)</td>
</tr>
</tbody>
</table>

| **Programmes directed at substance abuse in adolescents** |                       |        |              |                                                                 |
| (Elickson and McGuigan 1993) | United States | Randomised controlled trial II-1 | 6527 adolescents equally allocated to two groups | ALERT programme | Initially reduced drug usage but effect had gone when examined at 6 years (p>0.05) |

| **Programmes targeting adolescents in ethnic minority groups** |                       |        |              |                                                                 |
| (Malgady et al. 1990) | United States | Randomised controlled trial II-1 | Intervention group = 70 adolescents with severe behavioural problems, 40 controls No long term follow-up | Education programme about famous Puerto-Rican role models | Improved self concept (scale data no NNT) |

| **Programmes selectively targeted at adolescent children of substance abusers** |                       |        |              |                                                                 |
| (Emshoff 1989) | United States | Randomised controlled trial II-1 | 200 adolescents equally assigned to two groups | Programme focusing on coping and social skills | Improved coping/social skills (no p values) |

| **Programmes for targeted groups to enhance parenting skills** |                       |        |              |                                                                 |
| (Strayhorn and Weidman 1991) | United States | Randomised controlled trial II-1 | Intervention group=50, control group=48 Low SES mothers and child with behaviour problems One year follow-up | Parent child interaction training including group work and role plays | Lower rates of conduct problems as rated by teachers and blinded raters (p=0.02) (scale data no NNT) |

| **Programmes for high-risk adolescents with symptoms of depression** |                       |        |              |                                                                 |
| (Clarke et al. 1995) | United States | Randomised controlled trial II-1 | 76 = intervention group, 74 control group | Sessions teaching students to identify dysfunctional thoughts and develop coping strategies for them | Significant reduction in depression in intervention group (p<0.05) (NNT=9) |
Table 34. Studies examining the effect of CBT on depression in adolescents that have/have not also evaluated the effect of the treatment on suicidal behaviour

<table>
<thead>
<tr>
<th>Author Country</th>
<th>Study design Level of evidence</th>
<th>Sample</th>
<th>Methodological issues</th>
<th>Results/ conclusions</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Clarke et al. 1992) United States</td>
<td>Randomised controlled trial II-1</td>
<td>40 treated adolescents, 19 controls on waiting list</td>
<td>Small sample size, differing results from self reported versus diagnostic definitions of recovery</td>
<td>No significant difference in suicide attempts but improved depression as measured on Beck Depression Inventory ($p&gt;0.05$) (a meaningful NNT cannot be calculated due to use of scale-based data)</td>
</tr>
<tr>
<td>(Gilham et al. 1995) and Jaycox et al. 1994)</td>
<td>Controlled trial II-2</td>
<td>69 children (10-13 years old) at risk of depression followed for two years compared to 49 children in control group on wait list</td>
<td>Random assignment of schools not subjects</td>
<td>CBT significantly more effective than control ($p&lt;0.01$) (no NNT due to scale-based data)</td>
</tr>
<tr>
<td>(Clarke et al. 1995)</td>
<td>Randomised controlled trial II-1</td>
<td>150 adolescents randomly assigned to CBT or usual care</td>
<td></td>
<td>CBT significantly more effective than usual care ($p&lt;0.05$) (NNT=9 over 12 months)</td>
</tr>
<tr>
<td>(Kahn et al. 1990)</td>
<td>Randomised controlled trial II-1</td>
<td>68 young people (aged 10-14 years) randomly assigned to four groups</td>
<td></td>
<td>CBT and relaxation therapy significantly better than self help model treatment or wait list control ($p&lt;0.001$) (No NNT due to scale based data)</td>
</tr>
<tr>
<td>(Clarke et al. 1992)</td>
<td>Randomised controlled trial II-1</td>
<td>59 young people (14-18 years) randomly assigned to CBT, CBT+parent training or waiting list</td>
<td></td>
<td>CBT (+/- parent training) group had significantly less depression than wait list control group ($p&lt;0.05$) (no NNT due to scale based data)</td>
</tr>
</tbody>
</table>
Table 35. The effectiveness of DBT to prevent suicidal behaviour among young people

<table>
<thead>
<tr>
<th>Author</th>
<th>Study design</th>
<th>Level of evidence</th>
<th>Sample</th>
<th>Methodological issues</th>
<th>Results/Conclusions</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Linehan et al. 1991) United States</td>
<td>Randomised controlled trial</td>
<td>II-1</td>
<td>22 young people with borderline personality disorder treated with DBT compared to 22 given “usual treatments” Follow-up 12 months</td>
<td>Small sample size Significant baseline differences between study groups Heterogeneous treatments used in control group</td>
<td>Reduced suicide attempts Higher number of psychiatric in-patient days in control group Higher attrition in control group (p&lt;0.0.01) (NNT=3 over 12 months)</td>
</tr>
</tbody>
</table>

Table 36. The effectiveness of family therapy at preventing youth suicide

<table>
<thead>
<tr>
<th>Author</th>
<th>Study design</th>
<th>Level of evidence</th>
<th>Sample</th>
<th>Methodological issues</th>
<th>Results/Conclusions</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Harrington et al. 1998)</td>
<td>Randomised controlled trial</td>
<td>II-1</td>
<td>85 young people randomly allocated to family treatment and 77 to routine care Followed over 6 months</td>
<td>No assessment of suicidal behaviour</td>
<td>No significant reduction in suicidal ideation, hopelessness or family dysfunction between treatment and control groups (p&gt;0.05)</td>
</tr>
</tbody>
</table>
FOLLOW-UP

GP CARE VS OUTPATIENT

resulted in bias. Receiving regular care from another source) may have those without contact details and those already re-

tween each of the two groups, finally, the exclusion of the number of completed suicides be-
trol group was not described, nor was there any de-
cant limitations. The treatment received by the con-

of the intervention the study still had some signif i-
tempt by the authors to provide a rigorous evaluation from any scheduled appointments. Despite the at-

home visit, and reminders it the patient defaulted

ule of regular visits (at least weekly for one month

intervention used in this study consisted of a sched-

power calculation and an appropriate sample size, it

subgroups may derive more benefit from either

propriate to consider the possibility that particular

indicated that there was a significant benefit from these innovations. A closer examination of these studies indicates that three of the studies had an inadequate sample size and they were undertaken over a short duration. The study by Motto (1976) did not find that the benefit from more intensive follow-up was sus-
tained over a longer period of follow-up (five years).

The study by Allard et al. (1992) is notable, because it was the most recent and because the authors ex-

plicitly attempted to overcome the methodological deficiencies of its predecessors. The study included a power calculation and an appropriate sample size, it adopted a strict randomisation process and there was a high level of follow-up maintained for both the intervention and the control group. The intensive intervention used in this study consisted of a schedule of regular visits (at least weekly for one month then reducing to monthly after 3 months), at least one home visit, and reminders it the patient defaulted from any scheduled appointments. Despite the at-

tempt by the authors to provide a rigorous evaluation of the intervention the study still had some signifi-
cant limitations. The treatment received by the con-

rol group was not described, nor was there any de-

scription of the number of completed suicides be-
tween each of the two groups, finally, the exclusion of some patient groups from the study (including those without contact details and those already re-

ceiving regular care from another source) may have resulted in bias.

GP CARE VS OUTPATIENT

FOLLOW-UP

INTENSIVE FOLLOW-UP

Several older trials, mainly based on adult patients, have compared the provision of standard outpatient treatment with more aggressive and flexible treatment options such as home visits and telephone outreach (Welu 1977; Hawton et al. 1981; Chowdhury et al. 1973; Motto 1976) (See Table 38). Only two (Welu 1977; Motto 1976) of these four studies concluded that there was a significant benefit from these innovations. A closer examination of these studies indicates that three of the studies had an inadequate sample size and they were undertaken over a short duration. The study by Motto (1976) did not find that the benefit from more intensive follow-up was sustained over a longer period of follow-up (five years).

However, the study did have several methodological deficiencies and its result should be interpreted with caution. A major limitation of the trial was that a large number of patients were excluded from participation in the study (555 out of 654 were excluded). Furthermore, a significant number of the excluded patients were omitted because either their GP or the hospital consultants insisted on maintaining their care (notably the study does not identify the relative size of each group). It is likely that these patients may have been selected by their GP, or hospital consultant, on the basis of their ability to benefit from the treatment provided by that professional, therefore selection bias cannot be eliminated as a possible explanation for the results obtained by the trial. Although of modest size, the study also attempted to undertake some subgroup analysis. While it was appropriate to consider the possibility that particular subgroups may derive more benefit from either treatment setting, the study did not have sufficient sample size to effectively evaluate this hypothesis.

INPATIENT VS OUTPATIENT

CARE

Rudd et al. (1996) has commented that little conclusive evidence is available to confirm that in-patient care for adolescent suicide attempters is the optimal treatment. The implicit assumption that in-patient care is safer and more effective has largely been un-challenged in the literature despite increasing reports that a number of young patients self mutilate and commit suicide whilst hospitalised (Garrison et al. 1990; Vivona et al. 1995). Recently some research e.g. Rudd et al. (1996) and Gutstein and Rudd (1990) has examined the possibility that for selected groups of young people out-patient care can be an appropriate and effective therapeutic option. Both Rudd et al. (1996) and Gutstein and Rudd (1990) found that outpatient care was associated with favourable outcomes, however only one study used a randomised, experimental design with a control group (Rudd et al. 1996), furthermore the study by Rudd et al. (1996) had several significant limitations including a high attrition rate, relatively small size and difficulties with generalising from the setting of the trial (a male, military institution). In addition, the beneficial effects from the intervention in the trial were limited to improvements in symptomatology and did not in-
clude any significant reduction in suicidal behaviour (p>0.05) (no NNT). Consequently there is little conclusive evidence that the treatment of all (or for specific types of) adolescent suicide attempters can be safely and effectively carried out completely within an outpatient setting. However, there is also a corresponding lack of data to confirm that the best outcome is achieved when in-patient care is used for either all adolescent patients or for particular groups of young people. While in-patient care assures (at least partially) the likelihood that suicidal behaviour can be contained, it also may damage the therapeutic alliance and may induce regression (Cantor 1994). Conversely out-patient based treatments are plagued by high rates of non-attendance e.g. 52% of patients failed to attend more than two sessions in one study (Spirito et al. 1994) while 40% were non-compliant with treatment in the first month of another US-based programme (Piacentini et al. 1995). Several authors have argued that bearing in mind the growth of community care, and increasing alternatives to hospitalisation, there is now an urgent need for studies on the impact of hospitalisation (Cantor 1994; Bjarnason 1982; Gutstein and Rudd 1990).

**USE OF NO SUICIDE CONTRACT**

With a no suicide contract the patient promises not to engage in a (further) suicide attempt and to notify the therapist, parent or responsible adult if suicidal urges resurface (Brent 1997). The essential ingredient of the contract is the provision of 24 hour professional contact to assist when needed. The provision of 24 hour physician back up has been favourably compared to standard care where no 24 hour contact was provided (Morgan et al. 1993).

**METHODS TO IMPROVE COMPLIANCE**

Compliance with outpatient treatment has been recognised as major problem. Several authors have noted that outpatient based treatments have a high attrition rate (Brent 1997; Rudd et al. 1996; Trautman et al. 1993) and that non-compliant patients may be at higher risk of subsequent suicide (Welch 1977; Motto 1976). A number of strategies have been proposed to enhance patient compliance (abstracted from Brent (1997) and Spirito (1996):

- provision of definite follow-up appointments
- patient reminded by telephone
- 24 hour clinical back up for crises
- telephone follow-up by therapist if patient does not turn up
- contract between therapist/patient
- involvement of patient’s family friends.

**FOLLOW-UP FREQUENCY**

Although available research does not enable the specification of the optimal frequency of follow-up there is a strong indication that longitudinal contact does improve patient outcome (Hawton et al. 1981; Welch 1977; Rudd et al. 1996). Some authors have specified their optimal follow-up frequency; weekly in the opinion of Brent (1997) for 10-20 hourly sessions delivered on a weekly basis and monthly boosters for 6 months (Lewinsohn and Clarke 1990; Rotheram-Borus et al. 1994).

**DISCHARGE PLANNING**

Swedo (1989) in a retrospective chart review that used a case control design found that significantly more adolescent patients who had received discharge planning prior to leaving hospital had received outpatient based treatment. It is difficult to gauge the significance of this study due to its small sample size and retrospective design. Finally, it is also hard to generalise from the United States setting to New Zealand.

**FOLLOW-UP OF RECENTLY DISCHARGED PSYCHIATRIC PATIENTS**

Goldacre et al. (1993) in a cross sectional study found that there was a significant excess rate of suicidal death after the discharge of psychiatric patients (of all ages) from in-patient care in the Oxford (UK) region. Subsequently, Gunnell and Frankel (1994) has suggested that the provision of closer support and follow-up for recently discharged psychiatric patients by primary care practitioners could reduce suicidal behaviour among this group at an apparently vulnerable time.

**ISSUES IN THE IDENTIFICATION AND PREVENTION OF SUICIDE FOR MAORI AND PACIFIC ISLAND YOUTH**

Relatively little published research was available with regard to suicide and Maori and Pacific Island youth. Durie (1994) has noted that even for westernised Maori, cultural heritage is important in shaping ideas, attitudes and reactions especially during times of illness. Langford et al. (1998) has suggested that cultural alienation may be a significant factor in rising rates of suicide among Maori youth.
Effective cross-cultural communication is an integral part of establishing a therapeutic alliance with Maori people (National Health Committee 1996). Establishing rapport is important with communication and this requires that the health worker should recognise certain sensitivities (Beautrais et al. 1997a):

- it is not appropriate to immediately ask people to reveal their name (or personal information) without any preliminary remarks to establish rapport
- direct eye to eye contact is not appropriate when discussing sensitive issues
- a family member may appropriately answer questions on behalf of (often a younger) a person.

The definition of health for many Maori does not clearly distinguish between mental, physical and spiritual boundaries and may include issues associated with family relationships and awareness of the Maori language or other cultural parameters, so an exploration of risk factors may need to be broad, and include sensitive questioning of some of these other areas.

Aside from the typical symptoms of mental illness, the identification of Maori people at risk of suicide may require the careful and respectful probing of some of the following issues (Beautrais et al. 1997a):

- suggestions of breaches of cultural protocols
- preoccupation with a close relative who has died
- irritability and uncharacteristic aggression
- issues of justice (especially cultural) experienced by the person or their whanau which have resulted in intense shame or guilt
- unresolved grief or loss of a significant person or their own status
- somatic complaints that have no apparent physiological cause.

It may be appropriate to seek the assistance of a Maori mental health professional in the assessment or treatment of a Maori person although clear boundaries of roles and responsibilities will need to be made (National Health Committee 1996). An effective understanding of these issues and working relationship may best be achieved through an established relationship with Maori health workers (National Health Committee 1996; Beautrais et al. 1997a).

Familial and social difficulties are a major cause of suicide among Pacific Islanders (Ellis and Collings 1997). Recognition must be made of the different cultural identities and practices of different Pacific Island nations (Ellis and Collings 1997). The assistance of a health worker, the inclusion of support people and the guidance of important figures such as church ministers from an appropriate country can be invaluable in the management of young, Pacific Island people at risk of suicide (National Health Committee 1996; Beautrais et al. 1997a). A number of reports have also emphasised the need for health services to be aware of the family based decision making of many Pacific Islanders (Lealaiauloto 1995; Crawley et al. 1995; Ellis and Collings 1997).

Table 38 provides a summary of the effectiveness of interventions for the management of suicidal young people.

**SUMMARY OF THE PREVENTION OF SUICIDE YOUNG PEOPLE IN PRIMARY CARE**

The prevention of suicidal behaviour by primary care practitioners has been conducted on two levels:

1. **Population-based prevention**

   School-based preventive programmes have become common in the United States although there is some uncertainty about their safety and effectiveness. Programmes that target at risk groups of youths appear to have the most promising ability to reduce suicidal behaviour among young people. Lobbying by primary care practitioners for the restriction of the means to suicide among young people and for responsible reporting of suicide events may be able to reduce suicidal behaviour among youths. Office based preventive interventions and education programmes to assist GPs to recognise and treat mental illness appear to be effective interventions. Uncertainty exists about the ability of primary care practitioners, working in youth clinics, to reduce suicidal behaviour among young people.

2. **Targeted prevention**

   Cognitive behavioural therapy (CBT) and group support can probably prevent suicidal behaviour among high-risk young people. However, less evidence is available for the effectiveness of family therapy, crisis intervention and psychoanalysis. Pharmacotherapy appears to be very effective at treating an underlying mental illness but less able to prevent suicidal behaviour in young people. The effectiveness of postvention has not been proven by any clinical trial, however most experts consider that it is a necessary
intervention to both prevent any deaths by imitation and to assist the grieving process for the survivors.

An appreciation of cultural factors was important in the prevention of suicidal behaviour among young people either within population-based or targeted interventions.

The effectiveness of interventions for the prevention of youth suicidal behaviour is summarised in Table 38.
Table 37. Controlled trials that have compared intensive follow-up with usual care in the reduction of youth suicidal behaviour

<table>
<thead>
<tr>
<th>Study</th>
<th>Number in Intervention: control groups</th>
<th>Follow-up Duration (months)</th>
<th>Number of suicides in intervention: control groups</th>
<th>Number of parasuicides in intervention: control groups</th>
<th>Social improvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Chowdhury et al. 1973)</td>
<td>71:84</td>
<td>6</td>
<td>0:0</td>
<td>17:19 (p&gt;0.05)</td>
<td>&gt;C</td>
</tr>
<tr>
<td>(Welu 1977)</td>
<td>62:57</td>
<td>4</td>
<td>0:0</td>
<td>3:9 (p&lt;0.05)</td>
<td>&gt;C (NNT=9.1 Over 4 months)</td>
</tr>
<tr>
<td>(Ettinger 1975)</td>
<td>670:681</td>
<td>12</td>
<td>75:81 (p&gt;0.05)</td>
<td>same</td>
<td></td>
</tr>
<tr>
<td>(Motto 1976)</td>
<td>417:453</td>
<td>24</td>
<td>7:16 (p&lt;0.05)</td>
<td>14:18 (p&gt;0.05)</td>
<td></td>
</tr>
<tr>
<td>(Hawton et al. 1981)</td>
<td>41:39</td>
<td>12</td>
<td>1:0</td>
<td>5:7 (p&gt;0.05)</td>
<td>=C</td>
</tr>
<tr>
<td>(Allard et al. 1992)</td>
<td>63:63</td>
<td>12</td>
<td>---</td>
<td>60:54 (p&gt;0.05)</td>
<td></td>
</tr>
</tbody>
</table>
Table 38. The effectiveness of interventions for the prevention of youth suicidal behaviour

<table>
<thead>
<tr>
<th>Intervention</th>
<th>Effectiveness</th>
<th>Level of evidence of main study(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Primary interventions</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>School prevention programmes</td>
<td>Possible</td>
<td>II-2</td>
</tr>
<tr>
<td>School-based programmes for targeted youth</td>
<td>Probable</td>
<td>II-1</td>
</tr>
<tr>
<td>Restriction of means of suicide</td>
<td>Possible</td>
<td>II-2</td>
</tr>
<tr>
<td>Restrict media presentation of suicide to reduce imitation</td>
<td>Possible</td>
<td>II-2</td>
</tr>
<tr>
<td>Office based preventive health by primary care practitioners</td>
<td>Possible</td>
<td>V</td>
</tr>
<tr>
<td>Educate GP to improve recognition of suicidal behaviour and psychiatric illness</td>
<td>Possible (but not based on young people alone)</td>
<td>II-2</td>
</tr>
<tr>
<td>Primary care practitioners in youth clinics</td>
<td>Possible</td>
<td>IV</td>
</tr>
<tr>
<td><strong>Secondary interventions</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Direct effect on suicidal behaviour</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cognitive behavioural therapy</td>
<td>Probable</td>
<td>II-1</td>
</tr>
<tr>
<td>Dialectic behavioural therapy</td>
<td>Possible</td>
<td>II-1 (one small study)</td>
</tr>
<tr>
<td>Family therapy</td>
<td>Possible</td>
<td>II-1 (poor quality)</td>
</tr>
<tr>
<td>SSR1 medication</td>
<td>Unlikely</td>
<td>II-1 (limited evidence with young people)</td>
</tr>
<tr>
<td>Psychoanalysis</td>
<td>Possible</td>
<td>V</td>
</tr>
<tr>
<td>Crisis intervention</td>
<td>Possible</td>
<td>II-1 (poor quality)</td>
</tr>
<tr>
<td>Group support</td>
<td>Probable</td>
<td>II-2</td>
</tr>
<tr>
<td><strong>Tertiary intervention</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Postvention</td>
<td>Probable</td>
<td>IV</td>
</tr>
<tr>
<td><strong>The effectiveness of service-based interventions in the management of suicidal behaviour among young people</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aggressive follow-up is better than usual care</td>
<td>Possible</td>
<td>II-1 (poor quality)</td>
</tr>
<tr>
<td>GP care is superior to hospital outpatient based care</td>
<td>Possible</td>
<td>II-1 (poor quality)</td>
</tr>
<tr>
<td>Outpatient (instead of in-patient) care is appropriate for selected groups</td>
<td>Probable</td>
<td>II-1</td>
</tr>
<tr>
<td>Suicide contract</td>
<td>Possible</td>
<td>IV</td>
</tr>
<tr>
<td>Methods to improve compliance</td>
<td>Possible</td>
<td>V</td>
</tr>
<tr>
<td>Ideal follow-up frequency</td>
<td>Possible</td>
<td>IV</td>
</tr>
<tr>
<td>Planning prior to hospital discharge</td>
<td>Possible</td>
<td>III-2</td>
</tr>
<tr>
<td>Close follow-up after discharge</td>
<td>Probable</td>
<td>II-1</td>
</tr>
</tbody>
</table>

(No p values)

**Key: (Note: the effectiveness and the level of evidence need to be read together)**

**Probable** = Reasonable evidence from at least one good quality study or established consensus from several studies

**Possible** = Evidence from study(s) that may have methodological limitations

**Unlikely requires further research** = Results from several currently available studies that generally suggest that the intervention is ineffective, although further research is needed to enable a definitive conclusion.
Conclusion

Primary care practitioners have an important role in the prevention of suicidal behaviour among young people in New Zealand.

This report has reviewed the important epidemiological trends in suicidal deaths, attempted suicide and suicidal ideation among young people in New Zealand. A model was developed that presented the risk factors for suicidal behaviour as a group of six inter-related domains. The presence of psychopathology was found to be the most important risk factor for suicidal behaviour among young people. Other important risk factor domains included socio-demographic factors, family characteristics and environmental factors. The second part of the report developed from these risk factors a number of strategies to assist the practitioner with the recognition, management and prevention of suicidal behaviour among young people. The key to recognition was an awareness of the main risk factors for suicidal behaviour coupled with the use of a series of direct questions to gauge the presence and extent of suicidal intent in a young person. Important tasks in management included a need to establish a close rapport and the careful assessment of which young people should be referred for specialist inpatient or outpatient care. A number of interventions were described to prevent suicidal behaviour either among groups of usually healthy young people or specific treatments that could be used for young people at high-risk of suicide. Other important components of a treatment plan included the provision of support and problem solving skills, reducing environmental stresses, and restricting the availability of lethal means of suicide.

A number of methodological limitations were identified in relation to the literature examining suicidal behaviour among young people (See Appendix 1).

During their practising careers primary care clinicians are likely to see a number of young people who may be close to undertaking some form of suicidal behaviour. Clinicians must therefore remain well trained in assessing suicide risk in their patients, keep vigilant to recognising the warning signs of suicide, and actively intervene by providing support and the appropriate treatment to suicidal young people and their families. It is hoped that this review will assist primary care practitioners to undertake these vital tasks.


Helgason, L. (1990) Twenty years follow up of first psychiatric presentation for schizophrenia: what could have been prevented? *Acta Psychiatrica Scandinavica, 81, 1990.*


Appendix 1

SUMMARY OF GENERAL METHODOLOGICAL DIFFICULTIES ASSOCIATED WITH SUICIDE RESEARCH

The methodological difficulties associated with suicide research among young people can be grouped under four main headings: general concepts associated with suicide research, measurement issues, sampling issues and issues associated with the choice of study design for research investigating suicide among young people.

1. General concepts

Differences exist in the epidemiology of youth suicide victims and those young people who attempt suicide (for example, more males commit suicide while females have a higher rate of parasuicide). These differences require that caution should be exercised in the comparison of research findings that have been based on suicide victims with that of those young people who have made a suicide attempt. Despite this caution it has been necessary to abstract information from one group (usually attempters) and apply it to the other (usually victims), largely because there are statistically more young attempters available for study and because of the obvious ability to acquire more information directly from attempters rather than rely on reports obtained from significant others.

Suicidal behaviour is not a psychopathological entity recognised by DSM –III-R classification. Studies that have concernthemselves with the treatment of suicide have often included a heterogeneous group of patients with a mixture of underlying mental disorders. It is important to ensure that the treatment and control groups of studies that have assessed the treatment of suicidal behaviour have undertaken suitable matching between their study groups. Likewise, it is also important to ensure that similar patient groups have been used when comparing studies that have assessed an intervention to reduce suicidal behaviour.

The findings from studies that have used adult subjects cannot be reliably generalised to adolescent populations. Significant contrasts exist in the hormonal and biological state of young people coupled with profound variations in the developmental and emotional states mean that treatments that are effective among adults may not be useful among younger populations, for example, tricyclic antidepressants (Keinhorst et al. 1995).

2. Measurement issues

Although suicidal ideation and behaviours have often been presented in the literature the definition of each of these entities is highly problematic. For example, some degree of suicidal ideation may be normal but prolonged preoccupation with death is abnormal. Similarly, many studies have failed to include any degree of lethality in relation to their definition of a suicidal attempt. This imprecision in the literature is especially important in relation to suicidal behaviour among adolescents, because adolescence is characterised as a time of intellectual self discovery some degree of consideration of death may be inevitable and estimates that have not been based on any strict definitions of ideation will overestimate the frequency of clinically significant suicidal ideation among young people. Furthermore, the high prevalence of suicidal ideation among young people largely prevents this variable from being a useful indicator of the outcome of interventions to reduce suicidal behaviour among youths. By definition, suicide occurs when a person has intended to kill themselves, however, ascribing intention to the actions of deceased people is notoriously difficult and often a matter for considerable judgement. Different definitions of suicidal behaviour have been used in research. Few studies have made any formal definition of a suicide attempt particularly in terms of lethality criteria. Most data on suicidal behaviour has been based on self-reported measures. It has been recognised that many attempts of suicide never receive any medical attention and therefore any assessments of the prevalence of suicide that have used administrative data from health care organisations may be an unrepresentative sample of the true prevalence. By contrast, it is also possible that study participants have not (consciously or unconsciously) been accurate in their recall of past suicide attempts. Uncertainty exists about the sensitivity and specificity of administrative databases that table the cause of death in different countries. These databases are usually based on information derived from death certificates completed by the deceased’s last medical attendant or provided by a coroner-medical examiner. Differences between countries may exist in the robustness of the information on these certificates based on the threshold that exists in each country, or region, for the completion of a post mortem investigation, and the extent of that investigation. Some researchers have suggested that because of the social stigma and possible insurance
implications coupled with the lack of any uniform criteria that can be used by coroners, it is possible that suicide rates are greatly underestimated in many countries (Grossman 1992).

Another issue is the difficulty in defining what is suicidal behaviour. Although most researchers have required that subjects who have been included in studies as suicide attempters must have exhibited an intent to die it is problematic to confirm that this wish was present before all deaths have occurred and it is difficult to exclude unconscious motivation or conscious denial as a factor in some events that are denied by the patient as representing suicidal behaviour. The lethality of the behaviour can also be difficult to accurately determine. Much depends on the patient’s perceptions of the lethality of the method and this subjective information is prone to inaccuracy. Suicidal behaviour has been broadly defined to include emotions, actions and cognitions that increase the likelihood of self-harm. However, such a broad definition might include, for example, smokers who were aware of the consequences of their actions but chose to maintain their habit. Instead most researchers have operationalised the definition to include the elements of a completed act (i.e. lethality and intent) with the exception that the person has survived and usually this was due to circumstances outside of the person’s control.

Difficulties exist with gathering data from young people by either interview or anonymous questionnaires. Either research tool could be associated with significantly inaccurate information. If, for example, the young person did not choose to seriously complete the questionnaire or chose not to cooperate with the interviewer. In either case people have often been requested to provide data from some years ago. Significant possibilities exist of inaccuracy in relation to recall bias or the possibility that the adolescent will telescope their past history and recall them as being more immediate than they actually were (Verhulst and Koot 1991). There has also been significant variation in the use of either lay or professional interviewers and different problems exist with either choice of research assistant.

Response rates or follow-up duration have also considerably varied between studies, and these differences may be important because suicidal youths may be more likely to decline to participate.

3. Sample issues

A significant number of studies that have estimated the prevalence of suicidal behaviour or ideation have been based on inadequately small sample sizes.

Many studies have recruited study participants from mental health facilities, emergency rooms, coroner’s files or special populations such as school pupils and have not been based on representative, community-based samples of young people. Research based on unrepresentative samples of young people fails to clearly elucidate the experience of all young people but instead only portrays the experience of those youths that have encountered either health or educational facilities. Data on young people who do not have contact with these institutions is especially important in relation to suicidal behaviour, because youths most at risk of suicide may be least likely to use these facilities. Community based samples are also difficult because homeless youths, who may be at elevated risk of suicide, may be under-represented.

Studies based on adolescent subjects are also prone to high rates of attrition and losses to follow-up. These losses may be especially significant for youth suicide as those young people who are lost to follow-up may be at particularly high-risk of suicidal behaviour.

Wide variations exist in the age groups of the participants in different studies. Although it is likely that the experience of young people in their early teenage years may be significantly different to that of young adults in early 20s these age groups are often grouped together in studies of youth suicide.

4. The choice of study design for research investigating suicide among young people

Many studies have used an ecological design to research suicide among young people. In these ecological studies the rates of a variable in a population e.g. the number of licensed guns have been compared to the number of suicides in a group that has either varied in time or place e.g. Brent et al. (1987). Although this type of study is useful for generating hypotheses it’s ability to demonstrate causality is markedly limited by

The inability of the ecological approach to exclude bias or confounding as alternative explanations for any associations between variables.
Many studies of suicidal behaviour among youth have used a cross sectional design, in which the exposure and the outcome are described at one point in time e.g. Dubow et al. (1989), Kashani et al. (1989). Despite the usefulness of this study design in relation to estimating the prevalence of suicidal behaviours the uncertain temporal relationship between the exposure (or risk factor) and the suicidal behaviour prevents any conclusions about causality. This problem is especially significant for young people, because adolescence is a stage, which is characterised by rapid developmental change and there is therefore a particular difficulty with determining whether certain risk factors were in place before or after the suicidal behaviour occurred (Farrington 1991).

A number of the investigations of the risk factors associated with youth suicide have been based at the individual level and have used a case-control study design called a psychological autopsy. This method involves the retrospective collection of information about a suicide victim’s personality, mental status and behaviours prior to their death e.g. Brent et al. (1994c). The information is derived by questioning family members and friends of the deceased and by reviewing any pertinent medical notes. Information derived from psychological autopsy studies will often be incomplete because some personal data may not be available from a victim’s friends or relatives. In addition, some information may be subject to bias, as friends and relatives may be more likely to recall information than similar controls as part of their need to make sense of a tragic event (Shaffer et al. 1988). Other studies that have adopted a case control design have used suicide attempters as the cases, with the associated advantage that more direct information has usually been available for the researchers e.g. Beautrais et al. (1996b).

Recently several prospective cohort studies have been undertaken e.g. Fergusson and Lynskey (1995b). Studies that have used this design have two main advantages, firstly, they permit the assessment of a clear temporal relationship between a risk factor and suicidal behaviour and secondly, they minimise the potential for selection bias (because participants are included in the trial before the suicidal behaviour has occurred).

Finally, very few randomised-controlled trials have been undertaken in relation to the evaluation of interventions to reduce suicidal behaviours. Three main difficulties exist with any attempt to evaluate the effectiveness of any interventions to reduce suicidal behaviour among young people:

**Ethical problem of randomisation**

Double blind controlled trials (the gold standard method of assessing the effectiveness of an intervention) cannot be ethically undertaken when the control group would consist of adolescents who would receive no treatment.

**Lack of appropriate control groups**

Suicidality is not a diagnosis, allocating suicidal patients into two groups to either receive a treatment or remain in a control group does not enable patients to be homogenously allocated to the two treatment groups. Suicidal patients can have a broad mixture of underlying psychiatric disorders (personality disorders, schizophrenia, depression etc) such that matching treatment groups can be very demanding.

**Suicidal behaviour is rare**

Even among high-risk groups such as suicide attempters further suicidal behaviours are relatively uncommon. Therefore, in order to achieve a statistically meaningful outcome, treatment groups must be large and follow-up must be undertaken over a long duration.

**Poor compliance**

Adolescents in general (and groups at risk of suicide in particular) are poorly compliant with attendance and treatment regimes.

These difficulties explain why there have been only a small number of studies conducted upon adolescent populations to evaluate the effectiveness of interventions to reduce suicide. In addition, few studies have adopted a randomised-controlled trial as their study design in preference to merely describing some of the results obtained by their programme.
Appendix 2

MEDLINE - STRATEGY ONE

Strategy One was designed to retrieve articles on adolescent suicide and any of the following:

- guidelines
- meta-analyses
- randomized controlled trials
- risk factors
- prevention
- interventions in the primary care setting

suicide/
suicide, attempted/
suicide-.tw.
or/1-3
*adolescence/
youth.tw.
adolescence.tw.
youth.tw.
(young adj3 (person: or people)).tw.
or/5-8
4 and 9
practice guideline.pt.
exp guidelines/
health planning guidelines/
guideline.pt.
or/11-14
randomized controlled trial.pt.
controlled clinical trial.pt.
randomized controlled trials/
random allocation/
double-blind method/
single blind method/
or/16-21
meta-analysis/
exp review literature/
(meta-analysis: or meta analy: or metaanaly:).tw.
meta-analysis.pt.
review academic.pt.
review literature.pt.
letter.pt.
review of reported cases.pt.
historical article.pt.
review multicase.pt.
23 or 24 or 25 or 26 or 27 or 28
29 or 30 or 31 or 32
33 not 34
animal/
human/
36 and 37
36 not 38
35 not 39
10 and 15
4 and 15
MEDLINE - STRATEGY TWO

Strategy Two was designed to retrieve articles on access/barriers to health care for adolescents

*adolescence/
adolescen:.tw.
youth:.tw.
teenage:.tw.
young adj3 (person: or people)).tw.
or/1-5
access:.tw.
barrier:.tw.
health services accessibility/
health care rationing/
or/7-10
6 and 11
general pract:tw.
primary health care/
family practice/
physicians, family/
adolescent health services/
nurse practitioners/
nurses/
or/13-19
12 and 20
exp mental disorders/
12 and 22
Strategy Three was designed to retrieve articles on the recognition/diagnosis and treatment of mental disorders in adolescents in the primary care setting.

suicid.:ti.
diagnos.:ti.
assess.:ti.
recognit.:ti.
or/2-4
1 and 5
adolescen:.tw.
*adolescence/
youth:.tw.
teenage:.tw.
(young adj3 (person: or people)).tw.
young adult.tw.
or/7-12
6 and 13
exp psychotic disorders/
exp anxiety disorders/
exp affective disorders, psychotic/
exp personality disorders/
exp substance-related disorders/
depression/
exp mood disorders/
or/15-21
5 and 13 and 22
primary health care/
physicians, family/
general practi:.tw.
family practice/
or/24-27
5 and 22 and 28
exp mood disorders/dt,th
depression/dt,th
exp psychotic disorders/dt,th
exp anxiety disorders/dt,th
exp affective disorders, psychotic/dt,th
exp personality disorders/th,dt
exp substance-related disorders/dt,th
or/30-36
13 and 37
14 or 23 or 38
limit 39 to english
letter.pt.
news.pt.
41 or 42
40 not 43
CLINPSYCH

exp attempted suicide/
exp suicide/
exp suicide prevention/
suicide.ti.
exp suicide prevention centers/
or/1-5
teenager:tw.
adolescen:tw.
youth.tw.
young person:tw.
young people.tw.
or/7-11
6 and 12
prevent:tw.
exp primary health care/
exp at risk populations/
prevention/
exp family physicians/
exp general practitioners/
exp family medicine/
suicide prevention/
suicide prevention centers/
or/14-22
13 and 23
limit 24 to english
24 not 25
from 26 keep 4,7-8,17,19,22,24-27,30
25 or 27
case report/
28 not 29

HEALTHSTAR

suicide/
suicide, attempted/
suicide.ti.
or/1-3
adolescen:tw.
young person:tw.
youth.tw.
young people.tw.
teenager:tw.
student:tw.
or/5-10
4 and 11
limit 12 to nonmedline
limit 13 to (yr=1988 or yr=1989 or yr=1990 or yr=1991 or yr=1992 or yr=1993 or yr=1994 or yr=1995 or yr=1996 or yr=1997 or yr=1998)

CINAHL

exp suicide/
suicide assisted/
1 not 2
suicid:ti.
3 or 4
*adolescence/
adolescen:.tw.
(teenage: or youth).tw.
(young adj3 (person: or people)).tw.
or/6-9
5 and 10
limit 11 to (yr=1988 or yr=1989 or yr=1990 or yr=1991 or yr=1992 or yr=1993 or yr=1994 or yr=1995 or yr=1996 or yr=1997 or yr=1998)
letter.pt.
case study.pt.
13 or 14
12 not 15

**EMBASE**

suicide attempt/
suicide/
suicide.ti.
or/1-3
*adolescence/
*adolescent/
adolescen:.tw.
youth:.tw.
(young adj (person: or people)).tw.
teenage:.tw.
or/5-10
4 and 11
risk assessment/
risk/
risk factor/
high risk population/
high risk patient/
or/13-17
12 and 18
limit 19 to english
suicide attempt/pc
suicide/pc
suicide.ti. and pc.fs.
or/21-23
11 and 24
limit 25 to english
*suicide/
*suicide attempt/
suicid:.ti.
or/27-29
limit 30 to english
limit 31 to review
20 or 26
32 or 33

**PSYCHLIT**

Suicide
Exact [SUICIDERS]
Exact [SUICIDE-PREVENTION]
Exact [SUICIDE-PREVENTION-CENTERS]
#3 or #4
adolescenc*
youth
teenage*
young
#6 or #7 or #8 or #9
#5 and #10
LA=ENGLISH
#11 and (LA="ENGLISH")
PY > "1987"
#13 and (PY > "1987")
Appendix 3

EXAMPLES OF PSYCHOMETRIC SCREENING DEVICES FOR SUICIDE RISK IN ADOLESCENTS INCLUDE

Suicide Probability Scale
A study by Larzelere et al. (1996) was the first presentation of the predictive validity of any measure of suicide risk in adolescents. The Suicide Probability Scale is composed of a total weighted score of 36 Likert items, on each of these items respondents can answer from 1 (none of the time) to 4 (most of the time). The scale is based around four sub-scales (hopelessness, suicide ideation, negative self-evaluation, and hostility). Using a prospective design (Larzelere et al. 1996) was able to show that the scale exhibited low sensitivity (48%) and poor specificity (21%). The authors concluded that the major failing of the scale was its lack of any consideration of the patients past suicide attempts and any consideration of their current plans, particularly the lethality of those plans.

PATHOS
This screening device was developed for adolescent patients presenting after an overdose to estimate their risk of a repeated suicide attempt. The device examines the yes/no answers of adolescents to five general questions about the duration of any precipitating problem, the overdose circumstances and premeditation, hopelessness and depression. A small study evaluating the device recorded a sensitivity of 100% and a specificity of 58% (Kingsbury 1996). However, the study was small and based on a highly selected group who had presented to one treatment centre. Despite the known association of suicide risk to mental illness the instrument correlated relatively poorly with any psychiatric diagnosis. The questions in the device were all noted to be broad and not well constrained to the dichotomous answers supposedly needed for the test. Most importantly, the study did not estimate the predictive validity of the instrument.

Suicidal ideation questionnaire (SIQ)
The SIQ is composed of 15 Likert items, which is designed to assess the respondent’s thoughts about suicide over the preceding month. Each item has a 7 point scale- from (0): ‘never had this thought’, to (7): ‘almost every day’, (Range and Knott 1997). Despite claims that it has high validity as a clinical screening tool (Range and Antonelli 1990), the SIQ failed to distinguish those adolescents at high-risk of suicide among 28 attempters in an institutional setting (Ritter 1990).

Multi-attitude suicide tendency scale
This scale consists of 30 Likert items, each with responses on a 5 point scale that are based on 4 broad factors (attraction to life, repulsion to life, attraction to death, and repulsion by death) (Range and Knott 1997). The scale was designed specifically for adolescents and variation has been obtained between normal high school students and those with psychiatric disorders (Osman et al. 1994).

Suicidal Tendencies test
This is a novel test that includes two sets of 4 stories that are best suited to children under 10 years of age (Range and Knott 1997). Each story has a heroic central character and depicts an attitude towards life or death. Scoring is based on the child’s responses to colour coded scales.

Suicidal behaviours questionnaire for children
This test is a simplified adaptation of an adult scale, which has four, questions each with 5 possible answers (Range and Knott 1997).
Appendix 4

THE AETIOLOGY OF YOUTH SUICIDE

An examination of the literature reveals that there are a number of consistent risk factors that lead to suicidal behaviours. These risk factors have been outlined in this report (See Section B: Risk factors for suicidal behaviour). To give an overview of the information and an assessment of the relative importance of the risk factors as they have been presented in the literature the following tables (See Tables A4.1 and A4.2) describe for each risk factor the number of studies reporting odds ratios, the range of the odds ratios and the median odds ratio. It should be noted that the studies included in these tables have not all been presented in this report and they have also substantially varied in their ability to reduce bias and confounding. These tables are reproduced with kind permission of the NHMRC and Dr A Beautrais.

The information presented in Tables A4.1 and A4.2 underline the importance of mental health factors as the strongest predictors of suicidal behaviour in young people. The corollary of this finding is that suicide prevention efforts should be primarily focused on reducing psychiatric illness among young people.

However, the rate of suicide in the population depends on not only the odds ratios for the risk factors but also the proportion of people in the population who are exposed to each of these risk factor. Population attributable risks give an estimate of the percentage of suicidal events that could be eliminated if the risk factor was eliminated (assuming that the risk factor was causally related to suicide). The NHMRC report by Dr Beautrais estimated the PAR for a number of risk factors from studies that had provided the appropriate unconfounded data. The author notes that the PAR estimates should be regarded with caution because of the heterogeneous nature of the studies on which the information has been based. In addition, as the NHMRC report observes the “best application of existing research into risk factors for suicide is for the purposes of identifying effective population-based approaches for minimising suicide risk, rather than for the prediction of individual suicide risk” (Beautrais 1998, p119).
Table A4.1 Summary of risk factors for suicidal behaviour presented in published controlled trials

<table>
<thead>
<tr>
<th>Risk factor</th>
<th>Number of studies</th>
<th>Odds Ratio Range</th>
<th>Odds Ratio Median</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Social disadvantage</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low socio-economic status</td>
<td>2</td>
<td>2.3-2.33</td>
<td>2.3</td>
</tr>
<tr>
<td>Poor educational achievement</td>
<td>2</td>
<td>5.1-7.8</td>
<td>7.7</td>
</tr>
<tr>
<td><strong>Family and childhood factors</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parental separation</td>
<td>4</td>
<td>1.9-4.3</td>
<td>3.0</td>
</tr>
<tr>
<td>Parental psychopathology</td>
<td>4</td>
<td>2.0-11.0</td>
<td>3.1</td>
</tr>
<tr>
<td>Family history of suicidal behaviour</td>
<td>2</td>
<td>2.3-4.6</td>
<td>2.45</td>
</tr>
<tr>
<td>Parental discord</td>
<td>2</td>
<td>2.4-3.1</td>
<td>2.75</td>
</tr>
<tr>
<td>Childhood abuse</td>
<td>7</td>
<td>1.5-11.8</td>
<td>5.7</td>
</tr>
<tr>
<td>Poor parental care</td>
<td>6</td>
<td>1.4-5.1</td>
<td>3.44</td>
</tr>
<tr>
<td><strong>Individual and personality factors</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sexual orientation</td>
<td>4</td>
<td>1.0-13.86</td>
<td>3.6</td>
</tr>
<tr>
<td><strong>Mental health factors</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Affective disorders</td>
<td>11</td>
<td>2.0-28.0</td>
<td>11.1</td>
</tr>
<tr>
<td>Substance abuse disorders</td>
<td>9</td>
<td>1.7-14.8</td>
<td>6.6</td>
</tr>
<tr>
<td>Conduct disorder/antisocial disorders</td>
<td>6</td>
<td>2.73-17.3</td>
<td>4.3</td>
</tr>
<tr>
<td>Anxiety disorders</td>
<td>5</td>
<td>1.0-4.9</td>
<td>2.7</td>
</tr>
<tr>
<td>Personality disorders</td>
<td>2</td>
<td>1.1-2.1</td>
<td>1.45</td>
</tr>
<tr>
<td>Co-morbid disorders</td>
<td>6</td>
<td>2.1-40.4</td>
<td>9.1</td>
</tr>
<tr>
<td>Previous suicidal behaviour</td>
<td>6</td>
<td>1.9-34.9</td>
<td>18.6</td>
</tr>
<tr>
<td>Previous psychiatric history or treatment</td>
<td>5</td>
<td>4.7-42.1</td>
<td>14.35</td>
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<tr>
<td><strong>Stressful life events</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interpersonal loss/conflicts</td>
<td>4</td>
<td>1.9-7.3</td>
<td>2.3</td>
</tr>
<tr>
<td>Legal/disciplinary crises</td>
<td>3</td>
<td>5.1-15.8</td>
<td>5.8</td>
</tr>
<tr>
<td>Other life events</td>
<td>2</td>
<td>2.1-3.9</td>
<td>2.6</td>
</tr>
<tr>
<td>Unemployment</td>
<td>3</td>
<td>1.0-2.0</td>
<td>1.6</td>
</tr>
</tbody>
</table>
Table A4.2  Population attributable risk estimates for the risk factors for suicidal behaviour in young people

<table>
<thead>
<tr>
<th>Risk factor</th>
<th>Study 1*</th>
<th>Study 2+</th>
<th>Study 3#</th>
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</thead>
<tbody>
<tr>
<td>Social disadvantage</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low socio-economic status</td>
<td>0</td>
<td>-</td>
<td>49.8</td>
</tr>
<tr>
<td>Poor educational achievement</td>
<td>-</td>
<td>14.8</td>
<td>33.9</td>
</tr>
<tr>
<td>Family and childhood factors</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parental separation</td>
<td>-</td>
<td>22.6</td>
<td>37.5</td>
</tr>
<tr>
<td>Parental psychopathology</td>
<td>-</td>
<td>9.75, 14.0</td>
<td>10.9</td>
</tr>
<tr>
<td>Family history of suicidal behaviour</td>
<td>-</td>
<td>13.7</td>
<td>-</td>
</tr>
<tr>
<td>Parental discord</td>
<td>-</td>
<td>-</td>
<td>26.2</td>
</tr>
<tr>
<td>Childhood abuse</td>
<td>-</td>
<td>-</td>
<td>26.1</td>
</tr>
<tr>
<td>Poor parental care</td>
<td>-</td>
<td>12.4-24.0</td>
<td>-</td>
</tr>
<tr>
<td>Mental health factors</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Affective disorders</td>
<td>45.7</td>
<td>36.8</td>
<td>57.1</td>
</tr>
<tr>
<td>Substance abuse disorders</td>
<td>25.0</td>
<td>16.2</td>
<td>29.0</td>
</tr>
<tr>
<td>Conduct disorders</td>
<td>23.6</td>
<td>16.6</td>
<td>26.8</td>
</tr>
<tr>
<td>Previous suicidal behaviour</td>
<td>-</td>
<td>22.8</td>
<td>46.8</td>
</tr>
<tr>
<td>Previous psychiatric history/treatment</td>
<td>-</td>
<td>-</td>
<td>64.0</td>
</tr>
<tr>
<td>Stressful life events</td>
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<td></td>
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<tr>
<td>Interpersonal losses/conflicts</td>
<td>-</td>
<td>23.1</td>
<td>23.1</td>
</tr>
<tr>
<td>Legal/disciplinary crises</td>
<td>-</td>
<td>34.6</td>
<td>20.2</td>
</tr>
</tbody>
</table>

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*Study 1 included (Shaffer et al. 1996; Gould et al. 1996)
+Study 2 included (Brent et al. 1993; Brent et al. 1994; Brent et al. 1994; Brent et al. 1996)
#Study 3 included (Beautrais 1996; Beautrais 1998)