The Scottish Government

Risk and Protective Factors for Suicide and Suicidal Behaviour: A Literature Review

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RISK AND PROTECTIVE FACTORS FOR SUICIDE AND SUICIDAL BEHAVIOUR: A LITERATURE REVIEW

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It should be noted that since this research was commissioned a new Scottish government has been formed, which means that the report reflects commitments and strategic objectives conceived under the previous administration. The policies, strategies, objectives and commitments referred to in this report should not therefore be treated as current Government policy.

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EXECUTIVE SUMMARY

Background

The Scottish Development Centre for Mental Health, in partnership with the University of Edinburgh (Research Unit in Health, Behaviour and Change and General Practice Section) and the University of Stirling (Department of Applied Social Science and Department of Nursing and Midwifery), were commissioned by the then Scottish Executive to undertake a review of the literature on risk and protective factors for suicide and suicidal behaviour.

The review had two overarching aims: first, to describe and assess current knowledge regarding the societal and cultural factors associated with increased incidence of suicide (risk factors), and to delineate the population subgroups that are at increased risk of suicidal behaviour; and second, to describe and assess current knowledge regarding factors that promote resilience and healthy survival against suicidal behaviour amongst people who are exposed to known suicidal risk conditions (protective factors).

Methods

The review was undertaken in four stages: first, the search for high quality systematic reviews relating to both risk and protective factors; second, the search for primary studies relating to protective factors; third, consultation with an expert panel to identify other evidence (e.g. in unpublished reports or the 'grey' literature) relating to protective factors; and, fourth, mapping the evidence on both risk and protective factors to identify the best quality and most recent studies for inclusion. At Stages 1 and 2 attention was paid to the recognition of areas characterised by an absence of evidence. Reviews/primary studies had to be published in the English language between January 1996 and February 2007.

Reviews/primary studies which focused on experimental studies of interventions, assisted suicide/euthanasia, suicidal thoughts and ideation (when not linked with suicidal behaviour) and self-destructive behaviours (such as pathological gambling or dangerous driving) were excluded. References were mapped into categories, informed by checklists of known risk and protective factors at individual, psychosocial and societal levels. Gaps in the evidence were identified and detailed. Data was extracted into a database specifically tailored to the requirements of the review. A robust quality assessment strategy, drawing on checklists relevant to the range of studies included in the review, was employed. An assessment of the transferability of findings to the Scottish context was made for each included review/study. The results were analysed and synthesised around the categories illustrated by the mapping tools for risk and protective factors, risk groups and levels of determinant. Particular attention was paid to drawing out data on marginalised groups.

Results

Results of the review are presented in two main sections. The first presents evidence from systematic reviews of risk factors, while the second contains both review-level and primary study evidence related to protective factors against suicidal behaviour. In total, there were 23

systematic reviews of risk factors, one systematic review of protective factors, and 44 primary studies relating to protective factors.

Risk factors

Mental illness

Across all age groups, genders and in a wide range of geographical locations, several diagnoses of mental illness, including affective disorders, schizophrenia, personality disorders and childhood disorders, and a history of psychiatric treatment in general have been established as risk factors for completed suicide. In schizophrenia and borderline personality disorder suicide risk appears to be elevated around the time of first diagnosis. For bipolar disorder and schizophrenia the elevated risk of suicide is further exacerbated by other risk factors, such as a history of suicide attempts, other psychiatric diagnoses, drug or alcohol misuse, anxiety, recent bereavement, severity of symptoms and hopelessness.

Attempted suicide

Those who self-harm have a much greater risk of dying by suicide compared with those who do not engage in this behaviour.

Substance misuse

Substance misuse increases the risk of suicide attempt and death by suicide. The risk associated with opioid use disorders and mixed intravenous drug use is greater than that for alcohol misuse. The risk of suicide from alcohol misuse is greater among women than among men.

Epilepsy

There is increased suicide risk associated with epilepsy. This risk varies across different types of epilepsy and in relation to the degree of severity of the effects of the illness. Persons who have temporal lobe epilepsy or who have had temporal lobectomies or surgical resections have an even greater risk of suicide.

Personality traits

There may be increased suicide risk associated with particular individual/personality factors. The evidence is particularly heterogeneous in this section both within and between reviews. Nevertheless, it can be stated with reasonable confidence that suicide risk is higher in: a wide range of personality traits including hopelessness, neuroticism, extroversion, impulsivity, aggression, anger, irritability, hostility, anxiety, attention deficit hyperactivity disorder (ADHD) and eating disorders such as anorexia nervosa and bulimia; and low problem-solving skills.

Genetic predisposition

Two reviews explored the evidence for genetic links to suicidal behaviour. There was no association between an intron 7 polymorphism of the TPH gene or for the 5-HT2A gene and suicidal behaviour.

Menstrual cycle, pregnancy and abortion

The risk of suicide attempt may increase in phases of the menstrual cycle which have lower oestrogen levels and in women who suffer from pre-menstrual syndrome. Pregnancy was also identified as a period during which women may experience elevated risk of suicidal behaviour. Furthermore, there is limited evidence that suicide rates are higher in women who have abortions compared to those who carry the baby to full term. However, careful analysis and replication of these findings is required and any confounding factors such as abuse rates or mental illness should be examined.

Unemployment

Unemployment is linked to elevated risk of suicide. Occupational social class and suicide and deliberate self-harm (DSH) are inversely linked: the lower the social class, the higher the risk of suicidal behaviour. Despite this, the highest proportional mortality rates for suicide are found in medical doctors and farmers, with female doctors having a higher risk of suicide than male doctors, reasons for this are not clearly established. Employment in the police force was not found to be a risk factor for suicidal behaviour.

Poverty

Poverty and deprivation are linked to suicide risk at an ecological (area) level. Areas with greater levels of socio-economic disadvantage (lower SES) have higher suicide rates.

Protective factors

Coping skills

Problem-solving skills may be protective against suicidal behaviour among those who have attempted suicide. There is conflicting evidence on the interplay between the suicide risk factor of hopeless and problem-solving-based coping skills. One study shows that problem-solving coping may mediate against hopelessness among adults who have attempted suicide while another demonstrates that hopelessness can mediate against the protective effect of problem-solving-based coping.

A number of coping skills requiring an element of self agency appear to be protective against suicidal behaviour particularly among adolescents, including self-control and self-efficacy, instrumentality, social adjustment skills, positive future thinking and sublimation. Being in control of emotions, thoughts and behaviour can mediate against suicide risk associated with sexual abuse among adolescents.

Reasons for living

High levels of reasons for living, future orientation and optimism protect against suicide attempt among those with depression. Hopefulness is protective against suicide among African-American women exposed to poverty and domestic violence. There is some evidence that those who have previously attempted suicide can develop positive coping strategies to protect themselves against future suicidal behaviour. Resilience factors are better predictors of suicidal behaviour than the amount of exposure to stressful life events.

Physical activity and health

There is some evidence that an attitude towards sport as a healthy activity and participation in sporting activity is protective against suicidal behaviour among adolescents. A perception of positive health may be protective against suicide among females who have experienced sexual abuse.

Family connectedness

Good relationships with parents mitigate against suicide risk, especially in adolescents and including those who have been sexually abused. Positive family relationships also provide a protective effect for adolescents including those with learning disabilities. Further evidence suggests that positive maternal coping strategies can have a protective effect on female adolescents. Having children living at home is protective against suicide for women; however, another study indicates that this protective effect may not exist among women who are HIV-positive.

Marriage is a protective factor against suicide (although more so for white females than black females in the USA). There is also evidence that marriage has a protective buffering effect against socio-economic inequalities related to suicide, particularly for men. It is important to consider other confounding variables including the finding that married men were less likely than non-married men to have problems with drugs, sex, gambling and having used or currently using psychiatric medicine.

Supportive schools

Supportive school environments, including access to healthcare professionals, are important protective factors among adolescents including those who have experienced sexual abuse, those with learning disabilities and those who identify as lesbian, gay, bisexual or transgendered.

Social support

Social support in general is protective against suicide among a range of population groups, including black Americans and women who have experienced domestic abuse.

Religious participation

There is a wide range of evidence to suggest that religious participation may be a protective factor against suicidal behaviour. However, the protective effect of religious participation can vary according to the level of secularisation within a country or community and social and cultural integration. Moral sanctions against suicide promoted by members of a religious community may have wider protective effect on the non-religious members of a community where the religious members are in the majority. Religious observance does not confer equal protection on individuals. Other factors, such as the observance of traditional cultural rituals, may have a stronger protective effect. The manner in which individuals relate to their God (in terms of religious coping style or private versus public expressions of religiosity) may further highlight different levels of protective factors within a single religious community.

Employment

There is some evidence that employment, especially full-time, has a protective effect against suicide. However, employment was not found to be protective among women who were HIV-positive.

Exposure to suicidal behaviour

One study found that exposure to accounts of suicidal behaviour in the media and, to a lesser extent, exposure to the suicidal behaviour of friends or acquaintances may be protective against nearly lethal suicide attempts. However, it is important to note that there is also a body of evidence of the suicide risks associated with media reporting.

Social values

Traditional social values may have a protective effect against suicidal behaviour among adolescent girls, while individualistic values may have a protective effect among adolescent boys.

Health treatment

Access to treatment by a health professional may be protective against repeat suicide attempts.

Gaps in the evidence available to this review

Key gaps in the review-level evidence for risk are:

- Children, especially looked after children
- Older people
- Being affected by aftermath of suicidal behaviour or completed suicide
- Prison/incarceration of young offenders

- Bereavement
- Rural/isolated communities
- Urban deprivation
- Homelessness
- HIV/AIDS
- Being LGBT
- Isolation and loneliness
- Aggression/violence
- Non-help seeking
- Those who have been physically and sexually abused
- Media exposure to suicide
- Disability

Primary study level evidence is available for these gaps. Gaps identified in the evidence for protective factors were:

- Self help and help seeking
- Neighbourhood quality
- Social capital
- Older people

Conclusions

The interplay between a number of risk and protective factors at individual and psychosocial levels that may impact in different ways on different individuals and communities at different times, must be taken into consideration when attempting to understand which factors promote resiliency and vulnerability to suicide and suicidal behaviour. Suicide is complex, risk can change with circumstance, what is a risk or protective factors for one person may not be the same for another in similar circumstances.

The evidence in this review reinforces the current approach to suicide prevention policy in Scotland and suggests that those involved in suicide prevention policy should consider identifying strategies that:

- tackle societal and structural risk determinants that result in social injustices that lead to social and health inequalities which the evidence links to inequalities in suicide risk
- enhance individual and psychosocial protective factors in the general population (and those who are more vulnerable) that prevent them from becoming future members of suicide risk groups where possible e.g. mentally ill, prisoners, unemployed, in poverty
- focus on developing family and community connectedness
- challenge and identify ways to remove cultural values and beliefs that unfairly expose certain groups to elevated suicidal risk such as those who are sexually abused, LGBT, prisoners, older people from society and institutions
- target interventions to particular suicide risk groups taking into account the highly distinct and individual risk and protective combinations to which people are exposed to
- seek to identify mechanisms that reduce the exposure of individuals and communities to multiple risk factors

- seek to identify mechanisms that increase the exposure of individuals and communities to multiple protective factors
- Ensure the continuation of the current national and local initiatives to work with the media, in particular the press, to enhance the protective aspects of responsible reporting of suicide
- support research that can increase knowledge and understanding of the complex interplay between risk and protective factors at individual, psychosocial and societal levels amongst different individuals and population groups across the life span

The importance of multi-strategies to strengthen protective factors, such as increasing problem-solving capabilities in individuals whilst promoting the development of supportive family and school environments is emphasized.

Future research on the determinants of suicide and suicidal behaviour should:

- address marginalised groups by building in greater ethnic and cultural diversity in samples
- explore resilience and protective factors within the context of the interaction of protective factors, adversity and risk factors rather than assume that protective factors can be identified as simply the inverse of risk
- attempt to understand the links between individual, psychosocial and societal risk and protective factors by using multi-level modelling to combine these variables in studies
- explore the individual, psychosocial and societal-level causal mechanisms behind the protective effects of spirituality
- address differences and commonalities between exposure to risk and protective factors between males and females as the determinants literature provides little evidence on why there should be different rates of suicide for males than females
- develop qualitative study designs that can provide further indepth and individualised insights into the complexities of modelling the interplay between risk and protective factors for suicide and suicidal behaviour across the life course

CHAPTER ONE INTRODUCTION

1.1 The Scottish Development Centre for Mental Health, in partnership with the University of Edinburgh (Research Unit in Health, Behaviour and Change and General Practice Section) and the University of Stirling (Department of Applied Social Science and Department of Nursing and Midwifery), were commissioned by the then Scottish Executive to undertake this review entitled 'Risk and Protective Factors for Suicide and Suicidal Behaviour: A Literature Review'.

Background

1.2 Over the last seven years suicide and suicidal behaviour have become increasingly recognised as important issues for public health policy and practice in Scotland. There are a number of reasons for this interest in suicide prevention activity, but a key driver is the high Scottish suicide rate (14.7per 100,000 compared to 8.2 per 100,000 in England and Wales, GROS, 2007). In response to concerns about this elevated rate, the Scottish Government commissioned this review of the risk and protective factors for suicide and suicidal behaviour.

1.3 Knowledge has increased about the way in which the suicide rate varies between different groups such as men and women, different socioeconomic groups and by geographic area. In addition there are shifting trends in suicide rates such as the doubling of rates for young men in the last 30 years, increased suicide rates among young women and young male prisoners. Health practitioners and policy makers, while concerned about these trends, are also more confident that enhanced understanding of risk and protective factors for suicide will enable the development of more effective and well targeted preventative interventions.

1.4 In 2001, the National Programme for Improving Mental Health and Well-being (National Programme) was established as part of the Scottish Executive's health improvement and social justice policy agenda. A key work strand within the National Programme was suicide prevention and in December 2002, Choose Life, the National Strategy and Action Plan to Prevent Suicide in Scotland (http://www.chooselife.net/) was published as a ten year policy initiative.

1.5. The local implementation of Choose Life is devolved to Community Planning Partnerships, supported by the National Implementation Support Team (NIST) who also coordinate a range of national-level suicide prevention initiatives and interventions. From April 2008, Choose Life became a dedicated programme delivered by NHS Health Scotland. Existing national coordination and local support functions will remain an integral part of the continuing Choose Life programme. Each Local Authority in Scotland has in place a Choose Life action plan which sets out how that area aims to coordinate and support suicide prevention activities through a range of voluntary, community and more recently statutory service based interventions and training initiatives. Local area activity will remain the remit of CPP's involving a range of local partner agencies.

1.6. Choose Life is an opportunity for local areas and the national team to develop innovative approaches to reducing the suicide rate in Scotland. Underpinning this activity is the expectation and desire of those involved in the implementation of Choose Life to make

optimal use of the evidence available about both the determinants of suicide and suicidal behaviour and what interventions work for whom in what contexts. A Scottish Executive commissioned review 'Effectiveness of Interventions to Prevent Suicide and Suicidal Behaviour: A Systematic Review' (Leitner, Barr and Hobby, 2008) has recently been completed.

1.7. The call for this review is based upon the recommendations included in the Scottish Executive commissioned report 'Suicide and Suicidal Behaviour: Establishing the Territory for a Series of Reviews' Scottish Executive Social Research' (McLean, Platt and Woodhouse, 2004). It also responds to the aims of Choose Life as a whole and relates in particular to two key objectives of the strategy:

- to provide early intervention and support to prevent problems and reduce the risks that might lead to suicidal behaviour in Scotland
- to improve the quality, collection, availability and dissemination of information on issues relating to suicide and suicidal behaviour and on effective interventions to ensure the better design and implementation of responses and services and use of resources

1.8. To inform successful local and national policy and practice around suicide prevention, up to date, accurate and transferable knowledge is required about the evidence available on the factors and conditions that determine whether an individual is at risk of suicide and suicidal behaviour and the conditions and factors that serve to protect them against suicide and suicidal behaviour.

Objectives

1.9. This review has two overarching objectives.

i) To provide a high quality review of current knowledge regarding: the societal and cultural factors associated with increased incidence of suicide; and population subgroups that are at increased risk of suicidal behaviour.

ii) To provide a high quality review of current knowledge regarding protective factors that promote resilience and healthy survival among people who are exposed to known suicidal risk conditions.

Scope and theoretical framework

1.10. This review seeks to inform the targeting of suicide prevention, intervention and postvention initiatives in Scotland by providing a concise review of evidence on the determinants of suicide and suicidal behaviour. To capture the breadth of the suicidology determinants field, to help focus the inclusion and exclusion criteria for the search strategy for evidence and to provide a framework for the analysis and presentation of the evidence, a multi-factorial theoretical framework of the determinants of suicide and suicidal behaviour has informed this review. The framework covers individual, psychosocial and societal levels and the entire human life course.

1.11. The empirical literature on suicide and suicidal behaviour risk and protective factors draws from a broad range of disciplines from genetics to economics. It is widely accepted that suicide and suicidal behaviour have a multi-factorial aetiology and therefore an inter-disciplinary theoretical framework is required to help understand the phenomenon (Beautrais *et al*, 2005). There is a range of models for suicide and suicidal behaviour in the literature demonstrating the potential interplay between risk and protective factors across individual, psychosocial and societal levels and life stages (e.g. Maris 2002).

1.12 Risk and protective factors are more likely to occur in combination than in isolation. Some risk factors such as self-harm may become protective factors depending on the risk factors to which an individual is exposed and their resultant coping strategies. The psychosocial environment and societal conditions will be different for different risk groups at different stages of their lives and therefore some risk and protective factors will vary according to risk groups and across the life span. Recent evidence has pointed to the changing risk of suicide through the different stages of life; therefore, the life course is of great importance in the theoretical framework for this review. (Beautrais 2003, Maris 2002)

1.13. Core to the work of the National Programme is a focus on positive mental health and responding to current understandings of what helps people to be mentally healthy, to recover from mental ill health and adversity and/or to stay well. Perhaps due to the historically prevailing, ill-health model of health related policy research, the literature in the suicide and suicidal behaviour field is weighted more towards risk factors and conditions than protective factors and resilience (Beautrais et al, 2005).

1.14. With this in mind, and to enhance the utility of this review for policy makers, service planners and practitioners, in terms of their developing effective solutions and interventions for suicide prevention, the review has taken a balanced approach that emphasises the importance of understanding the protective factors promoting resilience in the face of exposure to suicidal risk factors, as well as focusing on risk factors.

Definitions

1.15. To ensure clarity, focus and consistency for the review especially with regard to inclusion and exclusion criteria for the search strategy for evidence, several working definitions of key terms have been used, these are detailed below.

1.16. **Suicide** is death resulting from an intentional, self-inflicted act. **Suicidal behaviour** comprises both suicide and acts of self-harm that do not have a fatal outcome. Many terms are used to refer to the latter, including attempted suicide, suicide attempt, (deliberate) self-harm and parasuicide. Non-fatal self-harm may be subdivided into behaviour which was intended to result in death (high suicidal intent) and behaviour with mixed/ambivalent or no suicidal intent. Suicidal intent is not conceptualised as a binary (on/off) phenomenon; rather, it is a dimension or continuum, from no intent at one end to serious intent at the other. The literature reflects this reality; although some studies will focus on samples of those who are at high risk of dying by suicide, many will contain samples of people with varying degrees of suicidal intent and others may not be explicit about the level of suicidality within their sample. Therefore, in practice, it can be difficult to operationalise the distinction (made in the research tender) between suicidal (non-fatal) self-harm and non-suicidal (non-fatal) self-

harm. This review includes only those studies that explore self-harm with clear suicidal intent, as distinguished from studies of non-suicidal self-harm or suicidal ideation.

1.17. Risk and protective factors or determinants of suicide and suicidal behaviour can occur at the **individual, psychosocial** and **societal** levels. Societal (i.e. macro-level structural) factors and individual (i.e. micro-level biological, psychological and behavioural) factors can be captured by single measures, such as welfare systems or self esteem, respectively. For the purposes of this review, 'psychosocial' refers to the interrelation of behavioural and social factors, that is, the influence of social factors on an individual's mind or behaviour Martikainen et al (2002). Psychosocial health determinants can mediate the effects of social structural factors on individual health outcomes and can be conditioned or modified by the social structures and contexts within which they exist. Psychosocial determinants constitute a meso-level (intermediate) concept which cannot be fully captured by single measures at one level but rather require attention to both the individual and societal levels. Examples of factors that might constitute psychosocial influences include family, clubs, school and employment. These factors only become psychosocial influences when they actually impact on the health of the individual. Taking unemployment as an example, Martikainen explains that unemployment is not a psychosocial risk factor when the impact on the individual is limited access to income and material goods, it becomes a risk factor only when it impacts on feelings of self esteem that then impact on the health of the individual through modified behaviour or psychobiological processes.

1.18. Suicide and suicidal behaviour **risk factors** are individual behaviours, psychosocial or societal conditions that increase the likelihood that an individual will die by suicide. Risk factors can further be broken down into:

- **Predisposing factors** – historical factors, e.g. history of depression, which increase vulnerability to suicide
- **Vulnerability factors** – historical or sudden, e.g. impulsivity or work problems, which exacerbate the existing risk of suicidal behaviour
- **Trigger factors** – sudden, e.g. schizophrenic episode, loss, stress, which precipitate suicidal behaviour among predisposed individuals (Adapted from Maris, 2002)

1.19. Risk can be measured in different ways which have implications for understanding the extent of different risk factors within populations. **Relative risk** is the ratio of the suicide rate in persons exposed to a risk factor relative to that in people who are unexposed. **Attributable risk** is the difference between the incidence rates in risk of exposed and non-risk exposed groups. **Population attributable risk** is the attributable risk multiplied by the prevalence of exposure to risk factor in the population. This review seeks to inform and strengthen the evidence base to better understand the balance between suicide prevention interventions at societal and individual risk group levels. (The risk literature tends to be weighted towards relative risk studies, and this review did not identify any reviews with attributable risk data for inclusion).

1.20. **Protective factors** can be defined as societal or psychosocial conditions or individual behaviours that lessen the likelihood that an individual will engage in suicidal behaviour. The study of **resilience,** that is the capability of individuals and systems (families, groups, and communities) to cope successfully in the face of significant adversity or suicide risk, is a useful way of identifying protective factors. The capability for resilience develops and changes over time, is enhanced by protective factors within the individual system and the

environment, and contributes to the maintenance or enhancement of health. According to Masten and Powell (2003) resilience requires "(1) that a person is 'doing okay', and (2) that there is now or has been significant risk or adversity to overcome." The review will focus on evidence of resilience only among known suicide and suicidal behaviour risk groups. Resilience can be further broken down into:

- **Incidental resilience** is something that someone has been doing for a long time which promotes health and well being but which becomes a very important part of coping when difficulties arise (i.e. in the face of risk factors)
- **Reactive resilience** is something someone does as a direct response to difficult circumstances (RUHBC, 2006)

Note: A Glossary covering the above and other specialist terms is available on page 71.

CHAPTER TWO METHODOLOGY

2.1 The review followed an iterative process that was split into a series of discrete stages as illustrated by the 'Quorum Statement' in Annex 1.

2.2 There are clearly relationships between risk factors and protective factors for suicide and suicidal behaviour, but the relationship is complex and not well understood within the literature. Therefore risk and protective factors were treated as two separate searches in this review, each with some differences in process, as indicated below.

2.3 Core to the work of the National Programme is a focus on positive mental health and responding to current understandings of what helps people to be mentally healthy, to recover from mental ill health and adversity and/or to stay well. Perhaps due to the historically prevailing, ill health model of health related policy research, the literature in the suicide and suicidal behaviour field is weighted more towards this negative model. Therefore the literature holds a significantly larger body of evidence relating to suicide and suicide behaviour risk factors and conditions than protective factors and resilience (Beautrais et al, 2005).

2.4 With this in mind, and to enhance the utility of this review for policy makers, service planners and practitioners in terms of their developing effective solutions and interventions for suicide prevention, the review has a balanced approach that emphasises the importance of understanding protective factors that promote resilience in the face of exposure to suicidal risk factors as well as focusing on risk factors themselves. A substantial resource was apportioned to examining the available evidence on protective factors (objective 2) as well as focusing on risk factors (objective one) despite the greater amount of literature focusing on risk factors. To meet this aim we concentrated only on review level evidence for risk factors while review level and primary study level evidence, as well as grey literature, was accessed for protective factor evidence.

Step-wise methodology

2.5 The searches followed a stepwise methodology to identify relevant research evidence (see Figure 2.1 below).

Figure 2.1 Step-wise approach to searching for research evidence

Step	Risk factors	Protective factors
Step 1. Search for high quality systematic reviews. Identify areas where no such evidence exists	✓	✓
Step 2. Search for primary studies of protective factors. Identify areas where no such evidence exists.	x	✓
Step 3. Consult expert panel. Search for other evidence (grey literature, unpublished reports). Identify areas where no such evidence exists	x	✓
Step 4. Map the evidence into categories and select best quality and most recent studies/reviews for inclusion.	✓	✓

2.6 As only review level data was included in the review of risk factors, steps 2 and 3 were conducted in relation to protective factors only. At step 4 the literature for both risk and protective factors was mapped into categories to identify the best quality and most recent studies for inclusion. The following sections detail the approach for identifying evidence firstly on risk factors and then protective factors.

Identifying and selecting the evidence on *risk* factors

Inclusion and exclusion criteria

2.7 We included high quality reviews (systematic reviews and meta-analyses) of all population groups which explored risk factors for suicidal behaviours with clear suicidal intent. To ensure relevance, reviews must have been published in the English language between January 1996 and February 2007.

2.8 We excluded reviews which had the following foci:

a. Experimental studies of interventions and evaluations of interventions for suicidal behaviour
b. Assisted suicide or euthanasia (this topic area has a huge literature base that is worthy of separate investigation, since it includes different (albeit sometimes overlapping) risk factors)
c. Suicidal thoughts and ideation when they were not linked with actual suicidal behaviours with clear suicidal intent
d. Self-destructive behaviours such as pathological gambling, dangerous driving.

(Exclusions c. and d. did not easily lend to application at the database search strategy stage and therefore were implemented at the topic screening stage)

2.9 We also excluded non-systematic literature reviews and those published in a language other than English.

Searching for relevant reviews

2.10 Databases were selected to represent literature from a range of fields and disciplines, covering both the social and biomedical sciences. Preliminary searches revealed that the Cochrane Library is devoted to clinical trials, interventions, evaluations of interventions and reviews of interventions and therefore was removed from our original list of databases to be searched. Selected databases comprised:

- ASSIA: Applied Social Sciences Index and Abstracts
- EMBASE
- CINAHL
- ESRC Society Today
- IBSS
- MEDLINE
- PsychINFO

- Social Services Abstracts
- Sociological Abstracts

2.11 Search strategies were developed and adapted for each of the databases. Full search histories are provided in Annex 2. The strategy was based on the structure below:

1. Suicid$ OR (suicide AND (self-harm$))
2. (Assisted adj suicide) or (euthanasia)
3. 1 not 2
4. (risk adj2 factor$) OR (relative adj2 risk) OR (attributable adj risk)
5. English language
6. 1996-2006
7. (meta adj analys$) or (review) or (data adj synthesis)
8. 3 and 4 and 5 and 6 and 7

Screening and selection

2.12 References were downloaded into bibliographic software (Reference Manager v10) and titles were screened for relevance by two members of the research team (Fiona Harris & Joanne McLean). Disagreements in selections were negotiated and a final list of included references agreed.

Identifying gaps and mapping the evidence

2.13 Check lists of known risk factors at individual, psychosocial and societal levels and risk groups were developed by the research team and these informed a set of categories to map the evidence to. The check list was based on risk factors included in Choose Life, the National Strategy and Action Plan to Prevent Suicide in Scotland, Robert Plutchik's chapter "Aggression, violence, and suicide" in the Comprehensive Textbook of Suicidology, in which he identifies 62 risk factors for suicide attempts or suicides and on the research team's expert knowledge of evidence in the field of suicidology. The mapping categories were included in the inception report to the commissioners and approved (see Annex 3 for mapping categories). References were mapped into the categories and gaps in the evidence were identified and detailed. Where there were high numbers of reviews in a given topic area, a pragmatic selection process ensured that only the highest quality and most recent reviews were selected for inclusion following quality assessment.

Identifying the evidence on *protective* factors

Inclusion criteria

2.14 The search included primary studies or systematic reviews which identified the study of protective factors or strategies of resilience to lessen the likelihood of dying by suicidal behaviour as an objective. All population groups were included. The criteria used for study types were systematic reviews or meta-analyses, cross-sectional, case control, cohort and qualitative studies. As with the risk factor inclusion criteria, studies or reviews had to have been published in the English language between January 1996 and February 2007.

Exclusion criteria

2.15 Reviews or studies were excluded if they had the following foci:

a. Experimental studies of interventions or evaluations of interventions to promote resilience or protect against suicide/repeated suicide attempts
b. protective factors for assisted suicide or euthanasia
c. protective factors against suicidal thoughts and ideation when they were not linked with actual suicidal behaviours with clear suicidal intent
d. self-destructive behaviours such as pathological gambling or dangerous driving.

(Exclusions c. and d. did not easily lend to application at the database search strategy stage and therefore were implemented at the topic screening stage)

2.16 Studies reported in languages other than English were excluded from the review.

Searching for relevant reviews and primary studies

2.17 The databases listed in section 2.10 were also used to access protective factors literature.

2.18 A search strategy was devised and adapted for each of the databases. The strategy adopted the following structure:

1. Suicid$ OR (self-harm)
2. (Assisted adj suicide) or (euthanasia)
3. 1 not 2
4. (Resilien$) OR (recovery) OR (protect$) OR (cop$)
5. English language
6. 1996-2006
7. 3 and 4 and 5 and 6 and 7

2.19 For step 1 (identification of reviews) we added the following string which was combined with 'and' to the search above. For example:

8. (meta adj analys$) or (review) or (data adj synthesis)
9. 7 and 8

2.20 The use of broad search terms ensured that the review achieved a wide coverage of the literature related to protective factors among all known risk groups. Full search histories are provided in Annex 4 for systematic reviews and Annex 5 for primary studies. We also conducted further searches using search terms specifically designed to target literature on risk groups and protective factors where little literature had been found. On conducting this exercise with search terms related to prisons, prisoners, young offenders and so on, we found that the initial search had been comprehensive enough to encapsulate all of the relevant literature and that there was nothing to be gained from using risk group specific search terms.

2.21 An expert panel was consulted in order to identify further studies that could have been missed by the searches and to identify unpublished reports and grey literature that may have

informed the review topic. The expert panel was identified by the review team in consultation with the review commissioners and contacted by the review team for permission to be contacted for participation in the review. They were then emailed a brief summary of the protective factor literature gained through the search and asked to identify any key gaps in the literature and to suggest any unpublished/grey literature relevant to their field. The expert panel included representatives from a range of organisations, disciplines and fields whose interests reflected the aims of the review. A list of the organisations represented within this panel is provided in Annex 6 and the outcome of this process is detailed in the Quorum Statement in Annex one.

Screening and selection

2.22 References were downloaded into bibliographic software (Reference Manager v10) and titles were screened independently for relevance by two members of the research team (Fiona Harris & Joanne McLean). Disagreements in selections were negotiated and a final list of included references agreed.

Identifying gaps and mapping the evidence

2.23 Check lists of known protective factors at individual, psychosocial and societal levels and risk groups were developed by the research team and these informed a set of categories to map the evidence to. The check list was based on protective factors included in Choose Life, the National Strategy and Action Plan to Prevent Suicide in Scotland, and on the research team's expert knowledge of evidence in the field of suicidology. The mapping categories were included in the inception report to the commissioners and approved (see Annex 3 for mapping categories). References were mapped into the categories and gaps in the evidence were identified and detailed. Where there were high quality reviews in a particular area, relevant primary studies were excluded unless they provided data not covered by the review level evidence. The remaining primary study references were then mapped into categories (using the mapping tool in Annex 7) and where there were several papers related to the same topic area, only the highest quality and most recent studies were included. We also excluded papers where suicidal behaviour was not the main outcome measure. This excluded, for instance, papers exploring a large number of health behaviours and outcomes. Annex 8 provides a list of references to included reviews and primary studies.

Data extraction strategy

2.24 Data was extracted into a database specifically tailored to the requirements of the review. The database fields used are listed in Annex 9. The data extracted for a sample of papers was checked by a third member of the team.

Quality assessment strategy

Internal validity

2.25 At the data extraction stage, a robust quality assessment strategy was employed. This drew on checklists relevant to the range of studies included in the review (see Annex 10). These checklists were adapted from previous studies conducted by the research team for the National Institute for Health and Clinical Excellence (NICE). This organisation has a number of quality checklists published within their manual for reviewers.[a]

External validity

2.26 Risk and protective factors tend to be fairly consistent worldwide, with some cultural variation. A further assessment of external validity was developed to help assess the transferability of findings to the Scottish context. This assessment considered whether the key target variable (risk or protective factor) was relevant to the UK and therefore to Scotland, the impact of socio-cultural differences and differences in health service provision that might have an impact on relevance to Scottish society. The table below (modified from one developed by Jepson et al, 2007) illustrates the criteria used for the scoring system.

Table 2.1 Relevance to the UK scoring

Score (A-D)	Description
A (directly relevant)	Includes UK studies
B (probably relevant)	Includes non-UK studies but the context/population group would apply equally to UK settings
C (possibly relevant)	Includes non-UK studies that may have some application to UK settings but should be interpreted with caution. There may be strong cultural or institutional differences that would have limited applicability in the UK
D (not relevant)	Includes non-UK studies that are clearly irrelevant to UK settings

2.27 The quality of a paper was only used to exclude papers where the number of studies was deemed unmanageable or when poor quality studies or reviews existed alongside a good quality paper covering the same topic. Details of the reasons for excluding papers are provided in the results of the review.

Data synthesis and analysis

2.28 The mapping tools for risk (see Annex 3) and protective factors (see Annex 7), and levels of determinant (see para. 1.17) formed the structural basis of the analysis and synthesis of the included references. The method of synthesis drew on a meta-narrative approach as

[a] See the quality checklists in the NICE document 'Methods for development of NICE public health guidance' March 2006 (http://www.nice.org.uk/page.aspx?o=299970).

discussed by Greenhalgh et al (2005). Given the broad range of study types, topic areas and populations included within this review, a meta-analysis would not be appropriate as this is only possible (and indeed informative) in review studies with homogenous research design and population groups. The meta-narrative approach enabled a comprehensive overview of a wide range of literature on risk and protective factors for suicide and suicidal behaviour, and a detailed analysis on specific population groups across the lifecourse.

Limitations

2.29 The application of the inclusion criteria for this study means that studies of suicidal thoughts and/or ideation and/or suicidal behaviour such as self-harm *without* clear suicidal intent are excluded. Another limitation is that risk factors are only reviewed at systematic review level resulting in 'gaps' in the evidence included because known risk areas have not been systematically reviewed within the last ten years. However, taking the above methodological decisions was necessary to ensure both clarity of focus and a manageable level of references given the requirements of the original commissioning specification and the level of resource made available for the review by the commissioners. Therefore a significant literature with potential relevance to the topic of suicide is not addressed by this review. The implications of the evidence gaps within this review are considered in more detail in Chapter 4 of this report.

2.30 A further limitation is that the evidence available from studies focussing on protective factors is sparse, and therefore the evidence cited in this review for protective factors is sometimes based on as little as one study or on a number of studies on the same protective factor but across heterogeneous populations.

CHAPTER THREE RESULTS

Introduction

Chapter structure and notes on content

3.1 This chapter is divided into two main sections: the first section contains the evidence from systematic reviews of risk factors and the second, contains both review level and primary study evidence related to protective factors against suicidal behaviour. In total, there were 23 systematic reviews of risk factors, one systematic review of protective factors, and 44 primary studies relating to protective factors.

3.2 Papers appear more than once within the results section where they include data that are relevant to different sub-sections. Evidence tables encompassing all of these studies and reviews are listed in Annex 11. A full list of the included risk and protective factor references is provided in Annex 8. In order to avoid repetition in our summaries of the results, where reviews include data relevant to a number of sections, this is reported briefly under the appropriate headings rather than repeating the full results more than once. In the event that the reader requires more detail, they are directed to the evidence tables in the appendices, which contain results from each paper rather than results divided by risk or protective factor categories.

3.3 Attempts have been made, as far as is possible with studies that are often concerned with multiple protective factors and complex suicide risk groups, to set out the evidence firstly by individual, then by psychosocial and societal-level protective factors, followed by population sub-groups. Sub-groups may represent those known to be at elevated risk of suicide and suicidal behaviour, such as persons with schizophrenia who are at risk of non-fatal self-harm. Where the evidence allows, the sub-groups are further sub-divided according to life course stages.

3.4 Where the term deliberate self-harm (DSH) appears, this refers to the author's own use of the term. We only report results of self-harm where authors have indicated that this is linked to suicidal intent, in accordance with our definition of suicidal behaviour (see chapter one).

3.5 To make the main text of this report more accessible to the lay reader, the full quantitative data relating to findings of included studies have been reported only in the evidence tables (Annex 11). Not all of the included reviews and primary studies reported odds ratios (or relative risks) and confidence intervals in their results, we note where this is the case. Relative risk (RR) is the ratio of the risk of an event among an exposed population to the risk among the unexposed. An Odds Ratio (OR) is the ratio of the odds of an event in an exposed group to the odds of the same event in a non-exposed group. Therefore RRs can be interpreted as increased or decreased likelihood of an event between exposed and unexposed populations. In other words, when RR of suicide among the employed compared to the unemployed is 3.0, this can be interpreted as "suicide is 3 times more likely to occur in the unemployed population than in the employed population." However, ORs are difficult to comprehend directly and should not be interpreted (as is commonly done) as being equivalent to the RR. Thus, an OR of 2.5 of smoking among self-harmers compared to non-self-harmers cannot be interpreted as "self-harmers are 2.5 times more likely to be smokers than non-self-

harmers." It is more appropriate to state that "self-harmers are more likely to smoke than non-self-harmers (OR: 2.5; 95% confidence interval: X.X – Y.Y).

3.6 Rather than report the statistical significance values for each finding reported within the main text of the review, when a result is given as significant the p-value will be p=0.05 or less and confidence intervals will lie within 95% certainty.

3.7 Where possible, an indication of the strength of the evidence for a particular risk or protective factor is given when included in the reported reviews or studies. However, it was not possible to use set criteria (e.g. criteria such as number of studies) to provide a universal quantitative indicator of the strength of evidence across all sub-sections of this review. This was mainly due to the lack of consistency in type of studies included and the authors' acknowledgement of the imbalance between the amount of available evidence on risk factors and protective factors.

3.8 If papers referenced in the results (chapter 3) are not included in the systematic review proper (e.g. where it is an earlier paper updated and superseded by a paper included in the review), then the reference is given as a footnote.

Risk factors: the evidence

Individual-level factors: mental ill-health

3.9 Under the category of 'mental health' (with mental illness as a risk factor) the reviews below are further divided into three papers addressing mental ill-health in general, two papers on affective disorders, one review exploring borderline personality disorder and one review of schizophrenia as a risk factor for suicidal behaviour. There are a further two reviews that explore multiple risk factors within two high risk groups: schizophrenia and bipolar disorder.

General mental ill-health

3.10 Both of the reviews in this section explored completed suicides across a range of psychiatric diagnoses. Arsenault-Lapierre et al (2004) conducted a meta-analysis of overall and specific psychiatric diagnoses found in studies of completed suicides in order to explore potential gender and geographical differences in the distribution of psychiatric disorders among suicide completers. This population based review included 27 studies (14 from within Europe), with a total of 3275 completed suicides. Out of the total number of suicides, 87.3% had been diagnosed with a mental disorder prior to their death. Major gender differences were found. Diagnoses of substance-related problems, personality disorders and childhood disorders were more common among male suicides, whereas affective disorders, including depressive disorders, were less common among males. However, the gender differences were not completely clear-cut, as age was a mediating factor. Where there were significant differences, the female sample was older than the male one. Geographical differences were also likely to be present in the relative proportion of psychiatric diagnoses among suicides, although again this included a range of age groups. Psychiatric diagnoses were present in the majority of cases in all regions. This ranged from 89.7 % of the American suicides with at least one diagnosis, compared with 88.8 % of the European suicides, 83.0 % of the Asian suicides and 78.9 % of the Australian suicides. The authors concluded that, although a

diagnosis of mental illness is clearly linked to suicide risk, gender and geographical differences are also apparent. However, these conclusions should be interpreted with caution, as the authors acknowledged that the results may have been confounded by the age variations across studies.

3.11 Fleischmann et al (2005) explored the role of specific mental disorders and their comparative importance for understanding suicide and its prevention in young people. Using a narrative approach the review synthesised evidence from 13 studies from seven countries (including one UK-based study). They included 894 suicide completers with an age range of 10-30 years. The majority of cases (88.6%) had a diagnosis of at least one mental disorder. Mood disorders were most frequent (42.1%), followed by substance-related disorders (40.8%) and disruptive behaviour disorders (20.8%). Of the 236 diagnoses that included information regarding the subcategories, 56.4% were major depressive disorder, 22.0% were mood disorders not otherwise specified, and 16.5% were dysthymia. Substance-related disorders were divided between drug use disorders/drug abuse and alcohol dependence/alcohol abuse. Of the 339 diagnoses, 53.7% were alcohol-related, and 46.3% were related to drug use disorders/drug abuse. Disruptive behaviour disorders' included conduct disorder, attention-deficit disorder, oppositional disorder and identity disorder. Information on the subcategories was available for 156 diagnoses, of which 66.0% were attributed to conduct disorder, 16.0% fell under attention deficit disorder, and 13.5% were disruptive behaviour disorders (without further specification). Only four of the studies used a case control design and provided odds ratios. The authors conclude that, in developing strategies for the prevention of suicide in young people, there is a need to broaden the notion of risk to include a wide range of psychiatric diagnoses that extends beyond the focus on depression.

3.12 Neeleman (2001) provides further evidence for mental ill-health as a risk factor for suicidal behaviour from a review of multiple risk factors (reported further below). Those with adult personality disorder, a psychiatric history, schizophrenia, bipolar disorder, depression or neurosis were 6.1-19.7 times more likely to die by suicide than those who were not mentally ill, with depression and bipolar disorder located at the higher level of risk.

Affective disorders

3.13 Bostwick and Pankratz (2000) conducted a review with the aim of both generating an alternative estimate of suicide risk than that reported by Guze and Robins (1970)[1], and to question the generalisability of their earlier estimate. This review included mainly observational studies and results were combined narratively, also drawing on a random effects model. Forty-one papers were included in the final meta-analysis with a total of 31,159 participants. They found that there was a hierarchy in suicide risk among patients with affective disorders. The estimate of the lifetime prevalence of suicide among affective-disordered patients who had a history of being hospitalised for suicidal behaviour was 8.6%, compared to 4.0% among hospitalised affective disorder patients who had no history of suicidality. The lifetime suicide prevalence for mixed inpatient/outpatient populations was 2.2%, and for those who did not have an affective illness, it was less than 0.5%. The case fatality prevalence of affective disorder inpatients significantly differed from that of both

[1] Guze SB and Robins E. (1970). 'Suicide and primary affective disorders'. British Journal of Psychiatry, 117: 437–438.

suicidal inpatients and affective disorder outpatients. The case fatality prevalence of the affective disorder outpatients and the suicidal inpatients also displayed a significant difference. Although patients with affective disorders had an elevated risk of suicide compared to the general population, no risk factor, including classification of diagnostic subtype, reliably predicted suicide. They claim that their findings demonstrated that there is a 'hierarchy of risk' closely related to the contexts and intensity of treatment and that the clinical decision to hospitalise offers a useful indicator of increased suicide risk.

3.14 One review explored the prevalence of completed suicide in depressed patients (Wulsin, Vaillant and Wells, 1999). This included 57 studies (132,128 participants) from a wide range of countries including Scotland and other parts of the UK. Twenty-nine (51%) of the studies showed a positive relationship between depression and increased mortality, 13 (23%) showed a negative relationship, and 15 (26%) had mixed results. The authors found that there were too few well-controlled, comparable studies to develop a reliable estimate of the mortality risk associated with depression. Only six studies controlled for more than one of the four major mediating factors: severity of physical illness, smoking, alcohol or suicide. Results were grouped as follows: group one included psychiatric patients identified via a psychiatric assessment or diagnosis; group two included a community dwelling sample identified by self report measures; and group three consisted of those medical or community samples assessed by structured interview, comparing depressed to non-depressed and controlling for physical illness. Suicide accounted for less than 20% of the deaths in the samples of patients identified by psychiatric diagnosis or assessment, and less than 1% in the medical and community samples. The authors stated that the lack of homogeneity and the variable methods used between studies made it impossible to take their meta-analysis further. Although the authors acknowledged that the studies included in this review were poorly controlled, they conclude that depression substantially increases the risk of death, especially death by unnatural causes and cardiovascular disease. However, clearly this paper raises the question as to how the risk of suicidal behaviour compares with the risk of death from other causes in persons suffering from depression.

Borderline personality disorder

3.15 One review explored the suicide rate related to borderline personality disorder (Pompili, Girardi and Ruberto, 2005), drawing on the evidence from eight studies with a total of 1179 participants who had a diagnosis of borderline personality disorder. These studies were based in USA, Canada, Norway and Switzerland. The results across these studies were aggregated to calculate the mean N of completed suicides per year for 100,000 persons with borderline personality disorder. A meta-analysis of the included studies showed variable results between different cohorts, demonstrating nevertheless a higher rate of death by suicide in this patient group in comparison to the general population. The authors also found that higher completed suicide rates were associated with a shorter follow-up time, which they suggested could indicate that suicide risk was greater around the time of first diagnosis. They also state that suicide rates are highly heterogeneous both across and within cohorts of different studies and that there were several limitations to the study: they used a sample of data restricted to studies published in medical journals, the studies varied in terms of diagnostic criteria, and data on co-morbidities were unavailable.

Schizophrenia

3.16 One paper exploring schizophrenia as a risk factor for suicidal behaviour (Palmer, Pankratz and Bostwick, 2005) focused on developing a methodology for estimating lifetime suicide prevalence from published cohorts. The 61 included studies, with a total of 48176 participants, drawn from Europe (including UK based studies), North America and Asia. The studies were separated into those with participants recruited at a range of points in their illness (32 studies) and studies of those recruited at either initial diagnosis of schizophrenia or their first admission to hospital (29 studies). Regression models explored the intersection of proportionate mortality, which calculated suicide completion as a percentage of all deaths in this cohort, and the percentage of the total number of those who died by suicide. The authors estimated the lifetime suicide prevalence for the group who had been followed up from first diagnosis or first hospital admission was 5.6%. The group who had been recruited at different points in their illness (which included participants with a wide range of time since first diagnosis of schizophrenia) had an estimated lifetime suicide prevalence rate of 1.8%. The authors derived an overall estimate of the lifetime risk of dying by suicide in those diagnosed with schizophrenia as 4.9%. They emphasised that the risk was highest around the time of initial diagnosis or the first onset of symptoms. However, as Hawton et al. (2005a) argued (reported more fully below), studies should take account of the multi-faceted nature of risk, since other factors in combination with a diagnosis of schizophrenia, rather than simply schizophrenia alone, increased a person's risk of suicide.

Multi-faceted risk factors within mental ill-health risk groups

3.17 There were two papers that explored risk factors more fully within particular patient groups known to be at higher risk of suicide. The first paper explored risk factors related to schizophrenia (Hawton et al, 2005a) and the other focused on persons with bipolar disorder (Hawton et al, 2005b). These papers demonstrated the multi-faceted nature of risk. While mental illnesses such as schizophrenia and bipolar disorder are known risk factors for suicidal behaviour, persons with these diagnoses were also subject to further risk factors that in some cases were similar to those of the general population.

3.18 The first of these reviews (Hawton et al, 2005a) explored risk factors for suicidal behaviour in the schizophrenia patient group who were over 16 years of age. Twenty-nine cohort and case-control studies (37 papers) from a wide range of countries (including the UK) were synthesised in a meta-analysis. The core results focus only on those areas with stronger evidence as not all of the same outcomes were measured across all papers, making it difficult to conduct the synthesis. The authors identified a history of suicide attempts as a factor that contributed to elevated risk of suicide. A history of previous depressive disorders was also implicated in increased risk, as was drug misuse and agitation or motor restlessness. Anxiety or fear around deteriorating mental health was another risk factor, as was a lack of compliance in following treatment plans. Finally, a recent bereavement was also associated with elevated risk of suicidal behaviour. Conversely, a lesser or reduced risk was linked to people experiencing hallucinations. The authors acknowledge the limitations of the review, since odds ratios are sometimes drawn from only two studies, and some of the included studies were very small (e.g. only 11 suicides and 11 controls).

3.19 The second review in this section explored the main risk factors for suicide and nonfatal suicidal behaviour in patients with bipolar disorder (Hawton et al, 2005b). Outcome

measures included completed and attempted suicide as well as non-fatal self-harm. The 37 studies (55 papers) varied in design (cohort, case-control and cross-sectional studies), with the majority from European countries (including UK) and North America. Reported study participants ranged from only three completed suicides matched with 136 controls to a very large study of 672 suicides and 14714 controls. Where more than one study reported the same variables, they were pooled and reported as odds ratios in accompanying tables. The main risk factors for suicide were reported to be a previous suicide attempt and hopelessness. The main risk factors for nonfatal suicidal behaviour included a family history of suicide, early onset of bipolar disorder, the extent of depressive symptoms (in one large study 137/219 cases compared with 230/429 controls), increasing severity of affective episodes, the presence of mixed affective states, rapid cycling, co-morbid Axis I disorders, and abuse of alcohol (2 studies) or drugs (2 studies). Suicide risk was higher in men than in women but there was no association with ethnicity, marital status or employment status. There was no gender difference in attempted suicide. The authors concluded that the prevention of suicidal behaviour in patients with bipolar disorder should pay attention to these risk factors in assessment and treatment aimed at reducing suicide risk. These results and conclusions should be accepted with caution, as the authors acknowledge the limitations of the evidence. Although one of the main risk factors was identified as hopelessness, this finding was drawn from only two studies, both with small numbers.

3.20 Across all age groups, genders and in a wide range of geographical locations, several diagnoses of mental illness have been established as risk factors for completed suicide, including: affective disorders (including depression, bipolar disorder etc), schizophrenia, personality disorders and childhood disorders. A history of psychiatric treatment in general is also a risk factor. In schizophrenia and borderline personality disorder suicide risk appears to be elevated around the time of first diagnosis. However, there is also evidence (for bipolar disorder and schizophrenia) that, while these diagnoses carry elevated risk, this is further exacerbated by other risk factors, such as a history of suicide attempts, other psychiatric diagnoses, drug or alcohol misuse, anxiety, recent bereavement, severity of symptoms and hopelessness.

Individual-level factors: self-harm

3.21 Neeleman (2001) conducted a review exploring the standardised mortality ratios for death by suicide, death by natural causes and accidental death in a total of 146 studies including a total of 1,179,126 participants. Studies were drawn from a wide range of countries including Western and Southern Europe. Results for deliberate self-harm (suicidal intent is not measured by the authors) from 14 cohorts and 21,385 subjects show that persons who self-harm are 24.7 times more likely to die by suicide compared with those who do not self-harm.

3.22 Those who deliberately self-harm have a much greater risk of dying by suicide compared with those who do not engage in this behaviour.

Individual-level factors: substance misuse

Alcohol misuse

3.23 Cherpitel, Borges and Wilcox (2004) investigated the link between suicidal behaviour (suicide and attempted suicide) and acute alcohol use in adults over 19 years of age. The 53 studies with over 10,000 participants were drawn from a wide range of countries, including Scotland and elsewhere in the UK. The majority of studies were purely descriptive, presenting the prevalence of suicide completers or attempters who tested positive for alcohol use. The results differed widely owing to the variation in approach to definitions, study designs, method of measuring blood alcohol levels, heterogeneity in terms of the focus of the studies (not necessarily just suicide and alcohol use) and so on. The percentage of completed suicides who were tested positive for blood alcohol ranged from 10–69%. For suicide attempters the figures for positive alcohol tests were similar (10–73%). The authors noted that the limitations of many of the studies included the lack of control groups, bias in selection and ascertainment, and small sample sizes. While there were over 10,000 participants across all of the studies combined, individual studies ranged in numbers from only 16 to over 6,000. There was also the problem that in many studies as many as 60% of deaths by suicide were not tested for the presence of alcohol. (In some cases this was not possible owing to the condition of the body or the length of time in hospital prior to death.) For a wide range of reasons, not all of the suicide attempters were screened for alcohol use. The results of a case-crossover pilot study indicated substantially higher risk of suicide during or shortly after use of alcohol compared with alcohol-free periods.

3.24 These findings are further supported by a review of multiple risk factors (Neeleman, 2001). Standardised mortality ratios for death by suicide in those misusing alcohol was 8.5 times higher than the comparison group.

General substance misuse

3.25 Wilcox, Conner and Caine (2004) explored substance misuse more generally (alcohol and illicit drug use disorders) and its impact on risk of completed suicide. This review aimed to update and expand on Harris and Barraclough's (1997) earlier review.[2] In total, there were 42 studies from a range of countries including Scotland and elsewhere in the UK. The authors estimated that heavy drinkers were more than three times more likely to die by suicide than the general population (standardised mortality ratio [SMR][3] = 351]) and those diagnosed with alcohol misuse disorder were nearly ten times more likely to die by suicide than the general population (standardised mortality ratio = 979). Standardised mortality ratios were also extremely high for those diagnosed with opioid use disorder (SMR=1351), intravenous drug use (SMR=1373) and mixed drug use (SMR=1685). As found in the Harris and Barraclough review, there was a high degree of heterogeneity, with similar limitations, although they concluded that persons who have opioid use disorders and mixed intravenous drug use have a higher risk for suicide, and the risk is greater than that for alcohol misuse. They also confirmed that the association between alcohol use disorders and suicide is stronger among women than among men, as concluded in the review by Harris and Barraclough.

[2] Harris EC and Barraclough, B., 1997. 'Suicide as an outcome for mental disorders. A meta-analysis', *British Journal of Psychiatry* 170: 205–228.
[3] See glossary

3.26 These findings are further supported by Neeleman's (2001) review of multiple risk factors in which standardised mortality ratios for death by suicide in illicit drug users was 10.1 times higher than that among non-drug users.

3.27 Substance misuse increases the risk of suicide attempt and death by suicide. The risk associated with opioid use disorders and mixed intravenous drug use is greater than that for alcohol misuse. The risk of suicide from alcohol misuse is greater among women than among men.

Individual-level factors: chronic illness

Epilepsy

3.28 One review reported on suicide risk related to epilepsy (Pompili et al, 2005), comparing data related to completed suicides who had epilepsy compared with completed suicide in the general population. This review included 29 studies from a range of countries (including the UK), with a total of 50814 participants, 187 of whom died by suicide. Results obtained for each study were synthesised to calculate the mean number of suicides per 100,000 per year for individuals suffering from epilepsy and comparisons made with suicide rates for the general population within the relevant countries. There were inconsistent results between studies. Although the authors state that a meta-analysis was performed and that results demonstrated that suicide in patients with epilepsy was more frequent than in the general population (with a table illustrating results from individual studies), they do not provide the relevant statistical results showing the results of the pooled data.

3.29 The meta-analysis demonstrated that suicide in patients with epilepsy is more frequent than in the general population. However, a number of cohorts of epileptic patients had a suicide rate lower than that of the general population. There were also large discrepancies between studies included in the review. For instance, suicides in surgically treated patients had widely disparate figures. In based on a UK study from 1968, the reviewers calculated the mean number of suicides per 100,000 for individuals suffering from epilepsy at 833 (and at 7.9 for the general population) whereas calculations based on more recent UK studies were much more modest (in 1973 epilepsy calculated at 136 per 100,000 and general population 4.4 per 100,000, in 1994 epilepsy calculated at 16 per 100,000 and general population 14.1 per 100,000, in 2001 epilepsy calculated at 11.8 per 100,000 and general population 11 per 100,000. Calculations were made based on cohort size, number of suicides and length of follow-up, all of which varied across studies. Risk factors identified within the included studies showed that temporal lobe epilepsy and those with temporal lobectomies and surgical resections had an increased risk of suicide. One study found increases in depression after surgery. Another study found a greater risk of suicide after the suppression of seizures or full control of seizures. The authors conclude that, although there is a greater risk of suicide among epileptic patients compared with the general population, within epileptic conditions there are wide variations that may be related to the type and severity of epilepsy or co-morbidities. These results should be interpreted with caution as there were large variations in the results between studies that cannot be explained simply by reference to the possibility of cultural differences between study countries.

3.30 Neeleman (2001) adds to the above from a review of a wide range of suicide risk factors comparing standardised mortality ratios for suicide with accidental death and death from natural causes. Results from four cohorts totalling 4116 participants suggest that epilepsy patients are not more likely to die by suicide than accidental death or death from natural causes.

3.31 There is increased suicide risk associated with epilepsy. However, there is also evidence that this risk varies across different types of epilepsy and in relation to the degree of severity of the effects of the illness. Persons who have temporal lobe epilepsy or who have had temporal lobectomies or surgical resections have an even greater risk of suicide.

Individual-level factors: personality

3.32 Brezo, Paris and Turecki (2006) conducted a very large review including 90 studies with over 20,000 participants (countries of origin not stated), to explore the significance of personality traits in suicidal behaviours. Outcome measures included suicidal ideation, attempts and completed suicide. They explored hopelessness, neuroticism, impulsivity, anger, irritability, hostility, and anxiety. Although results were reported in tabular form for individual included studies, there were no reported overall odds ratios for this review. The authors identified hopelessness, neuroticism and extroversion as those personality traits with the strongest evidence that supports the presence of these traits as risk factors for attempted suicide. The authors indicated a need for further research to determine whether aggression, impulsivity, anger, irritability, hostility, and anxiety were also useful markers of risk for the prediction of suicidal behaviour. The authors concluded that these selected personality traits may provide useful indicators to inform the prediction of suicide risk, but also suggest that future research should explore the contribution of personality traits in relation to the environmental and genetic variations in different gender, age, and socio-cultural groups.

3.33 Neeleman (2001) adds to the above from a review of a wide range of risk factors, with findings that suggest that adolescent neuroticism is a risk factor that makes young people almost 2.3 times more likely to die by suicide than the general population.

3.34 One review explored the possible association between attention deficit hyperactivity disorder (ADHD) and suicide in boys (James, Lai and Dahl, 2004). The review used completed suicides as an outcome measure (no indication of number of included studies or total numbers of participants) and narratively combined studies from Europe (including the UK) and the USA. The authors found that there was an association between ADHD and completed suicide, particularly for younger males. The suicide rate from studies of ADHD with long term follow-up was found to be 0.63–0.78%. In comparison to national suicide rates in the US, males aged 5-24 years with ADHD were nearly three times more likely to die by suicide. The authors concluded that males with ADHD have an elevated risk of suicide, since ADHD appears to increase the severity of co-morbidities such as conduct disorder and depression.

3.35 Another review explored suicidality in patients with eating disorders, obesity and weight concern (Pompili et al, 2006). Narrative synthesis was used to summarise the results of included studies (number of studies and participants not stated), although results were so heterogeneous that it was difficult to summarise the findings in a useful and succinct manner. Differences between studies reveal that there are ranges of severity and types of eating disorders that impact on suicide risk. Three of the included studies reported higher numbers

of suicide attempts and DSH among bulimic patients where they exhibited purging behaviour. Co-morbidities and other factors were also implicated in suicide risk. For instance, one study of suicide in bulimia found that 20% of those who had attempted suicide had a major depressive disorder, and 11% were drug and alcohol misusers (further details can be found in Annex 11). There were similar results for anorexia nervosa, with higher suicide attempts among the binge/purge sub-type; and also co-morbid mental illnesses and/or drug or alcohol misuse. No suicidal behaviour data were provided for obesity and weight concern. The authors concluded that, although there is an assumption that death from exhaustion and lack of food is the major cause of death in eating disorders, their results illustrate that compared to the general population, people with eating disorders have a higher risk of suicide.

3.36 One review explored the potential relationship between deficiencies in social problem-solving skills and suicidal behaviour in young people (that is, children, young people and younger adults) in high risk groups such as young offenders and psychiatric patients compared with the general population (Speckens and Hawton, 2005). Outcome measures were suicidal behaviour, defined by the authors as suicide attempts, deliberate self-harm and parasuicide. Some papers included ideation as well as suicide attempts in their analysis; only results relevant to our review are reported below. The review included 22 studies from the USA, Canada, Norway and the UK, using cross-sectional, case control and longitudinal study designs. Most of these studies, which compared adolescent patients with suicide attempts to either non-suicidal psychiatric or normal controls, found evidence for problem-solving deficits in the attempters. A further three cross-sectional studies of young offenders found lower problem-solving skills in suicide attempters. The case control studies verified results for cross-sectional studies, although the comparative risk of suicidal behaviour was much higher when patients with a history of suicide attempt were compared with the general population rather than other patients with no history of suicide attempt. Longitudinal studies showed no significant difference in risk after controlling for hopelessness and depression. Because most of the studies were cross-sectional, it was not possible to establish whether deficiencies in problem-solving skills lead to depression and (therefore) the associated elevated suicide risk, or whether depression is the main factor which undermines problem-solving skills. The authors concluded that studies should control for other variables such as hopelessness and depression, in order to establish risk, although these results do suggest that low problem-solving skills may be linked to an increase in risk of suicidal behaviour.

3.37 There may be increased suicide risk associated with particular individual/ personality factors. The evidence is particularly heterogeneous in this section both within and between reviews, although it appears that the following statements can be made with reasonable confidence:

- A wide range of personality traits is implicated in higher risk of suicide, including hopelessness, neuroticism, extroversion, impulsivity, aggression, anger, irritability, hostility, and anxiety
- Persons with ADHD have an elevated risk of suicide
- A higher risk of suicide is associated with eating disorders such as anorexia nervosa and bulimia
- There is an association between low problem-solving skills and elevated risk of suicide attempt

These studies demonstrate the multi-faceted nature of risk.

Individual-level factors: genetic predisposition

3.38 Two systematic reviews investigated genetic determinants of suicide risk. The first review (Lalovic and Turecki, 2002) explored the association between suicidal behaviour and a biallelic intron 7 polymorphism in the tryptophan hydroxylase (TPH) gene. The 17 controlled studies included numbers of participants ranging from 27 suicide attempters and 190 controls to 231 suicide attempters and 282 controls and the studies. Participants represented a variety of population groups: violent offenders and arsonists, and hospital inpatients such as schizophrenics, depressed (unipolar) or bipolar patients. Studies were based in Europe, North America and Asia with suicidal behaviour (either completed suicide or attempted suicide) as outcome measures. The authors attempted to do an analysis based on violent versus non-violent suicide attempters but very few studies classified suicide attempts in a way that allowed this. The results of two meta-analyses compared suicide attempters or completers with healthy controls; and suicide attempters with non-attempters. From the combined results of comparisons within both groups, the authors concluded that there was no overall association between suicidal behaviour and an intron 7 polymorphism of the TPH gene. They suggested a need for standard criteria for classifying suicide attempts that would include degree of violence, lethality and intent. This would enhance the pooling of data for meta-analysis.

3.39 The second review re-examined the data on the genetic link between 5-HT2A (a serotonin receptor) with schizophrenia and suicidal behaviour (Li, Duan and He, 2006). This review included 61 papers reporting on 73 controlled studies with almost 20,000 participants, based in Europe and Asia. There was little heterogeneity found between all studies and despite the large sample sizes, they did not find an overall significant association of the T102C polymorphism with either schizophrenia or suicidal behaviour. Only one significant association was found, between A-1438G (a polymorphism in 5-HT2A) and suicidal behaviour. The authors concluded that their results did not support evidence for the association of the 5-HT2A gene with either schizophrenia or suicidal behaviour.

3.40 Two reviews explored the evidence for genetic links to suicidal behaviour. There was no association between an intron 7 polymorphism of the TPH gene or for the 5-HT2A gene and suicidal behaviour.

Individual factors: biomedical/physical determinants

3.41 Two systematic reviews provided evidence related to biomedical or physical determinants of suicide risk in women. One of these reviews investigated the possible associations between phases of the menstrual cycle and suicidal behaviour (Saunders and Hawton, 2006). Outcome measures used in the 44 included studies (sample sizes ranging from 13-3110 participants (countries not stated)) included suicide attempt, ideation, completion and DSH. These studies employed a range of research designs, which may explain the variation in the conclusions reached across these studies. In suicide completers, the percentage of women in the menstruating phase ranged from 15-100%, therefore providing insufficient (or indeed contradictory) evidence for this association. The authors found that the higher quality, methodologically more rigorous studies provide evidence of a positive relationship between aspects of the menstrual cycle and attempted suicide, and that

there is limited evidence that the first week of the menstrual cycle is more commonly associated with attempts. However, once again the results differ widely between studies. Suicide attempts appears to be associated with phases of the menstrual cycle that have lower oestrogen levels (such as the late luteal and follicular phases) and also in women who suffer from pre-menstrual syndrome. Despite the methodological limitations of the included studies, the authors conclude that the interplay between oestrogen and the serotonergic system may account for the association between the menstrual cycle and non-fatal suicidal behaviours.

3.42 Another review explored the causes of pregnancy-associated death in maternal homicide and suicides (Shadigian and Bauer, 2005). There were 28 included studies, from the USA, Mozambique, Finland, Zimbabwe, India, Bangladesh, Sweden, and Australia, with a total of 349 completed suicides. Although the leading cause of death in pregnant and recently pregnant women was found to be homicide, suicide is also a significant cause of pregnancy-associated death. Twenty-one of the included studies reported on pregnancy associated suicide. However, synthesis of the results across studies was difficult because of the variation in inclusion criteria between studies, with one study only exploring suicide during pregnancy and others defining the post-partum period as anywhere from 42 days to 8 years (with one year postpartum being the most common). The authors state that, although suicide is less prevalent than death by homicide and despite the variation in study types, all studies showed that suicide accounts for a significant proportion of pregnancy-associated mortality. The two included case control studies revealed a 3-6 times higher rate of suicide in women who had an abortion compared with pregnancies carried full term, however careful analysis and replication of these findings is required and any confounding factors such as abuse rates or mental illness (not made available in the review) should be examined.

3.43 Two reviews explored the evidence for biological/physical links to suicidal behaviour in women. The risk of suicide attempt may increase in phases of the menstrual cycle which have lower oestrogen levels and in women who suffer from pre-menstrual syndrome. Pregnancy was also identified as a period during which women may experience elevated risk of suicidal behaviour.

Furthermore, there is limited evidence (2 studies) that suicide rates are higher in women who have abortions compared to those who carry the baby to full term. Careful analysis and replication of these findings is required and any confounding factors such as abuse rates or mental illness (not made available in the review) should be examined.

Psychosocial-level factors: work and unemployment

3.44 Platt and Hawton (2000) conducted a systematic review that explored the relationship between conditions of the labour market and suicidal behaviour. 'Suicidal behaviour' was defined by the authors as completed and attempted suicide, parasuicide and deliberate self-harm. This review combined (by narrative synthesis) a large number (n=165) of studies from a wide range of countries including Scotland and other UK countries. The total number of participants was not stated. The authors acknowledge that variations in study design and lack of methodological rigour in some of the studies may have been responsible for the sometimes inconsistent results that they reported. The authors found an increased risk of suicide and DSH among the unemployed, although the magnitude of the risk varied by study design.

Individual cross-sectional studies showed an increased rate for both suicide and DSH, while individual longitudinal studies showed a double or triple rate of suicide, but inconsistent evidence for DSH. Aggregate-level cross-sectional and longitudinal studies showed either no evidence or heterogeneous results for this association. They also state that evidence from UK studies shows an association between unemployment, suicide and DSH in the 1970s but either a negative or non-significant association in the 1980s. There was no strong evidence to suggest female labour force participation rates have led to increased suicide rates. Once again, there were inconsistent results both within and between groups of studies of different research designs. Social class and suicide (and DSH) were linked: the lower the social class, the higher the risk. The authors found that the highest proportional mortality rates for suicide were found amongst those working in medical and allied occupations, farmers (males only), nurses, health, education and welfare professionals and personal service workers. This list includes professions (i.e. doctors and other health professionals) which would be compatible with a higher social class which would run contrary to findings on social class. The authors suggested that this may be because there is a lower mortality rate for other causes in these groups, there may also be a link to access to means.

3.45 Two further reviews pick up the theme of elevated risk of suicidal behaviour in particular professions or occupational groups. Lindeman et al (1996) provides substantiating evidence for the above statement regarding health professionals. This review explored the variations in estimates of risk (comparing absolute and relative mortality rates) for the medical profession, with particular focus on gender difference. A narrative synthesis of 14 studies containing almost 1,000 participants in total (from the UK, other European countries, USA and South Africa) revealed that the estimated relative risk was almost double for women, varying from 2.5 to 5.7 times more likely than the general population, while the range for male doctors was 1.1 to 3.4 more likely in comparison to the general population. In another comparison between medical doctors and other professions, the estimated relative risk for male doctors ranged from 1.5 to 3.8 more likely and from 3.7 to 4.5 more likely in female doctors than the general population. The authors found that the crude suicide mortality rate was approximately similar in male and female doctors. They concluded overall that the suicide rates among doctors were both higher than those in the general population and also higher than other professional occupational groups.

3.46 Hem, Berg and Ekeberg (2001) also explored suicide mortality rates and occupational group, in this case focusing on the police force. The twenty studies included in their review were drawn from North America, Europe (including UK studies) and Australia. Narrative synthesis of the results showed that, across the recent national studies, police did not have an elevated risk of suicide compared with the general population. The largest (nationwide) study was conducted in France, with a total of 749 police suicides. Adjusting for age and gender, the suicide rate in police was 34.8 per 100,000 per year compared to 35.4 per 100,000 per year in the general population. Another nationwide study in Germany also demonstrated no higher risk of suicide among the police force. In a population based study in England and Wales (covering 1982-96), police had the lowest occupational suicidal mortality ratio. Although the proportional mortality ratio increased from 61 to 79 in the later period included in the study, the trend was not statistically significant. Other studies showed inconsistent results. One study found that many countries do not keep records of suicides in the police force and few countries have gathered statistics on suicides. However, from the available evidence, the authors concluded that employment in the police force is not a risk factor for suicide.

3.47 Neeleman (2001) adds context to the above from a review of a wide range of risk factors comparing standardised mortality ratios for suicide with accidental death and death from natural causes. Results from three cohorts containing 26330 subjects show that those with lower socio-economic status (SES) and the unemployed are 2.2 times more likely to die by suicide than those from higher socio-economic groups or those who are employed.

3.48 Unemployment is linked to elevated risk of suicide. Occupational social class and suicide (and DSH) are inversely linked: the lower the social class, the higher the risk of suicidal behaviour. However, the highest proportional mortality rates for suicide are found in medical doctors and farmers, with female doctors having a higher risk of suicide than male doctors. Employment in the police force is not a risk factor for suicidal behaviour.

Psychosocial-level factors: poverty

3.49 One review (Rehkopf and Buka, 2006) explored the association between local area-level suicide rates and socioeconomic advantage/disadvantage (SES). The authors conducted a meta-analysis on 86 studies from a range of countries in Europe and beyond. Total numbers of participants included within the review were not stated. They found that the level of aggregation had an important effect on results. Analyses conducted at the community-level (that is, in a smaller local area) were significantly more likely to demonstrate lower rates of suicide among higher socio-economic areas than studies using larger areas of aggregation. Seventy per cent of the significant results showed an inverse relationship between higher socio-economic status and suicide, i.e. higher SES was associated with lower suicide rates. Neighbourhood-level aggregates produced an inverse relationship in 95% of the studies. Study results also varied according to the measure of SES used. Measures of area poverty and deprivation (using indexes such as Townsend/Carstairs) were, in 95% of studies, inversely associated with suicide rates. Median income was least likely to be inversely associated with suicide rates. Analyses using measures of unemployment, education or occupation were equally likely to demonstrate inverse associations as 73% of the included studies achieved such results using these measures. There was a trend towards an increase in the inverse association among the more recent studies (0% inverse association in years 1941-1960, 57% inverse association in years 1961-1980, and 76% inverse association in years 1981-2004). However, study results did not vary significantly by gender or by study design. The authors suggest that the heterogeneity of associations is mostly accounted for by study design features that have largely been neglected in this literature. Enhanced attention to size of region and measurement strategies in this review provided a clearer picture of how suicide rates vary by region. The authors reveal the importance of taking account of relative poverty or deprivation since this enables the researcher to provide a context for SES and how this impacts on the individual at community or neighbourhood level.

3.50 Poverty and deprivation are linked to suicide risk at an ecological (area) level. Areas with greater levels of socio-economic disadvantage (lower SES) are more likely to have higher suicide rates.

Protective factors: the evidence

Individual-level factors: problem solving

3.51 Three studies relevant to the review identified problem-solving skills as protective against suicide and suicidal behaviour within different population groups.

3.52 Elliott and Frude (2001) used a cross-sectional interview study to explore the relationship between level of hopelessness and stressful life events (measured across the two years preceding suicide attempt) and coping strategies, among a sample (n=80) of people aged 18+ years who had self-poisoned in Wales. Their results showed that hopelessness was a strong predictor of suicide risk ($r = 0.6$) but that problem-focused coping strategies had a mediating effect on this. They found that problem-focused coping strategies had a negative correlation ($r = -0.34$) with suicide attempt and that the higher patients scored on the hopelessness scale, the less they tended to employ problem-focused coping (although this finding only approached statistical significance).

3.53 Chapman, Specht and Cellucci (2005) set out to explore the association between risk and protective factors and suicide attempts among a sample (n=105) of a female prison inmate population using a cross-sectional study with a key focus on hopelessness as a risk factor for suicide attempt. Survival and coping beliefs and problem-focused coping strategies were negatively correlated with suicide attempt. A secondary objective was to test whether these protective factors remained when controlling for hopelessness, that is, exploring the role of hopelessness in mediating protective factors. Conversely to Elliott and Frude, they found that, when controlling for hopelessness, the protective effect of survival and coping beliefs and problem-solving coping was not statistically significant.

3.54 Using a case control study, Donald et al (2006) investigated risk and protective factors for medically serious suicide attempts among young Australian adults using a sample (n=475) of young adults (18-24 years) admitted to a hospital emergency department following a suicde attempt (n=95) and matched controls from a population survey (n=380). Using a social-ecological protective factor model that considers how individuals interact with their social and environmental contexts, they found that locus of control and problem-solving confidence protected against suicide attempts.

3.55 Problem-solving skills may be protective against suicidal behaviour among those who have attempted suicide. There is conflicting evidence on the interplay between the suicide risk factor of hopeless and problem-solving based coping skills. One study shows that problem-solving coping may mediate against hopelessness among adults who have attempted suicide while another demonstrates that hopelessness can mediate against the protective effect of problem-solving-based coping.

Individual-level factors: self control of behaviour, thoughts and emotion

3.56 Several studies provide evidence on protective factors that centre around elements of perceived self control of behaviour which contribute to resilience. The studies cover three population groups: young people/adolescents; those with depression or borderline personality disorder; and women who have been exposed to domestic violence.

Young people

3.57 In a qualitative interview based study of resilience in sample (n=13) of previously suicidal female adolescents (15-24 years), Everall, Altrows and Paulson (2006) set out to understand how these adolescents had overcome their suicidal behaviour. From their results, the authors identified four main domains of resilience (based on the dynamic and multi-dimensional process represented by resilience), three of which are relevant in this section of the review:

- cognitive processes, that is, having the control to gain a better perspective on their lives through positive future thinking and focusing on the positive rather than negative aspects of self and the present rather than the past
- purposeful and goal directed action, that is, a sense of control and self-efficacy enhanced by taking action to change their situations, in turn developing their confidence and self esteem
- emotional processes, that is, the ability/willingness to face difficult emotions or anger and motivation towards recovery

3.58 Piquet and Wagner (2003) used a case control study to compare the coping responses of 23 hospitalised adolescent (13-18 years of age) suicide attempters in the USA with those of 19 hospitalised non-attempters matched on diagnosis and demographics. Although the sample size in this study was small (n=42), the results demonstrated that coping effectiveness was significantly higher among the control group than among the suicide attempters, with suicide attempters using more automatic coping (involuntary responses such as approach and avoidance) responses than effortful coping responses (processes in which individuals regulate their attentional and behavioural response tendencies). Greater coping effectiveness in suicide attempters was also linked to a decline in suicidal symptoms (although no statistical test of this association was reported). The authors concluded that suicide attempters may be more exposed to stressful situations that are not controllable which may explain their increased likelihood to respond using automatic e.g. avoidance coping strategies.

3.59 Apter et al (1997) carried out a case control study of suicide attempting inpatient and non-attempting inpatient and non-patient adolescents (12-19 year olds) in Israel (n=223) to examine defence mechanisms in suicidal behaviour. They found that sublimation (the internal process of transforming emotional dynamics that are (usually) considered to be unpleasant into socially acceptable attitudes and states of mind and good qualities of character) correlated negatively with both suicidal and violent behaviours.

3.60 Chandy, Blum and Resnick (1997) took a sub-sample of boys reporting to have been sexually abused and a control group from participants in the National Longitudinal Study of Adolescent Health (US School Grades 7-12) to explore the protective factors that help male victims of sexual abuse to overcome vulnerability to a number of associated factors (including suicide). They found that sexual abuse, while associated with a higher risk of negative behaviours (including suicidal behaviour), is mitigated by protective factors, including being in control of behaviour, thoughts and emotion.

Adults

3.61 In a cross-sectional study, Kelly et al (2000) explored the relationship between recent life events, social adjustment and suicidal behaviour in a sample (n=80) of adult (over 18 years of age) patients with major depression or borderline personality disorder in the USA, 53 of whom had attempted suicide. In particular the authors aimed to explore the potential protection that high levels of social adjustment (defined as a broad measure of functioning in work, personal relationships, family life and available social support) might provide against suicidal behaviour. The authors found that high levels of social adjustment within immediate and extended families and overall may be protective against stress-related suicidal behaviour.

3.62 Meadows et al (2005) carried out a case control study to examine the role of protective factors (hope, spirituality, self-efficacy, coping, social support-family, social support-friends, and effectiveness of obtaining resources) against suicide attempts among economically, educationally, and socially disadvantaged African-American women (18-59 years) who had experienced recent intimate partner violence and who had attempted suicide. The sample (n=200), included 100 women with the above characteristics who had presented at a large urban trauma centre following a suicide attempt and 100 controls who had no history of suicide attempt and had presented at a walk-in clinic for non-emergency medical problems. Women with high levels of coping, high self-efficacy and high effectiveness in obtaining resources were more likely to have attempted suicide than were women with lower levels of these factors, respectively. A greater number of protective factors in combination was significantly associated with lower likelihood of having attempted suicide.

3.63 A number of coping skills requiring an element of self control including self-efficacy, instrumentality, social adjustment skills, positive future thinking and sublimation appear to be protective against suicidal behaviour particularly among adolescents and/or at times of stressful life events,. Being in control of emotions, thoughts and behaviour can mediate against suicide risk associated with sexual abuse among adolescents.

Individual-level factors: hopefulness, reasons for living and optimism

3.64 Several studies explored factors related to individual-level reasons for living, optimism and hopefulness as protective against suicide among a diverse range of population groups.

Women who have experienced domestic violence

3.65 Meadows et al (2005) (also reported above) found that one of the main protective factors against suicide attempts among economically, educationally, and socially disadvantaged African-American women (18-59 years) who had experienced recent intimate partner violence and who had attempted suicide was hopefulness. Those with high levels of hopefulness were less likely to have attempted suicide than those with low levels of hopefulness.

People with depression

3.66 Malone et al (2000) used a cross sectional study (n=84) to test the hypothesis that 'reasons for living' might protect or restrain US patients (18-80 years of age) with major depression from making a suicide attempt. Patients who had not attempted suicide scored higher on the following items in the reasons for living inventory: feelings of responsibility toward family, fear of social disapproval, moral objections to suicide, greater survival and coping skills, and a greater fear of suicide. Clinical suicidality was inversely correlated with reasons for living (canonical correlation = –0.64). Neither objective severity of depression nor quantity of recent life events differed between those who had and had not attempted suicide. This suggests that reasons for living can mediate against suicide attempt at times of risk such as severe depression or stress. The protective effect of reasons for living may be more relevant to how suicidal behaviour is expressed than how often stressful life events occur.

3.67 Hirsch et al (2006) conducted a cross-sectional study in the USA with a sample (n=202) of depressed adult in- and out-patients aged between 50 to 88 years. The objective of the study was to test the hypothesis that future orientation (defined as the ability to think about the future, the cultivation of a general positive outlook and mood about the future, the development of strategies to achieve goals and the presence of reasons for living) is associated with lower levels of suicide ideation and lower likelihood of suicide attempt in patients being treated for depression. They found that higher scores for future orientation were associated with a lower probability of a history of attempted suicide in the past than lower future orientation scores. However, future orientation was not associated with current suicide attempt status. Older participants were less likely to have attempted suicide, but there were no differences related to gender.

3.68 Oquendo et al (2005) undertook a cross-sectional study in the USA to determine whether the Reasons for Living Inventory (RFLI) might capture protective factors against suicidal behaviour in a sample (n=460) of hospitalised Latinos and non-Latinos with diagnosis of major depression, bipolar disorder or schizophrenia aged 18 - 80 years. Protective factors against suicide attempts were found to include moral objections to suicide and survival and coping skills; these factors had a stronger relationship to suicide attempt than ethnicity. Latinos were found to be less likely than non-Latinos to have made lethal suicide attempts and scored much higher on the Reasons for Living Inventory than non-Latinos, suggesting that moral objections and survival beliefs are protective against suicide for this group.

Previous suicide attempters

3.69 Chesley and Loring-McNulty (2003) undertook a cross sectional study in the US with a sample (n=50) of community-based adults who had attempted suicide in the past to understand the experience of the suicidal individual and to identify factors that contributed to survival following a suicide attempt. The question around what was preventing future attempts gained the following responses (percentages are of the total sample): 14% said health professional intervention; 10% developing a sense of self-empowerment; and 10% achieved personal / professional success; 10% new outlook on life. In response to the question 'Has someone or something made a difference in keeping you alive?', 18% said children; 15% treatment by health professional; 15% self-empowerment; 14% spirituality;

22% personal relationships; 5% personal and professional success; 3% change in attitude; 2% medication; 2% support groups; 2% sobriety; 1% structure in daily life; 1% lifestyle change. The authors interpreted this as meaning that most of their sample had identified positive reasons for living and had developed successful coping strategies which had contributed to their survival following a suicide attempt.

3.70 High levels of reasons for living, future orientation and optimism protect against suicide attempt among those with depression and those exposed to stress. Hopefulness is protective against suicide among African-American women exposed to poverty and domestic violence. There is some evidence that those who have previously attempted suicide can develop positive coping strategies to protect themselves against future suicidal behaviour. Resilience factors such as those above have been found to be better predictors of suicidal behaviour than the amount of exposure to stressful life events.

Individual protective factors: perceptions of positive health and participation in sporting activities

3.71 Two studies explored the relationship between positive perceptions of health and suicide attempt in adolescents. Chandy (1996) undertook a case control study with a sub-sample (n=2022) of girls reporting to have been sexually abused and a control group from participants in the National Longitudinal Study of Adolescent Health (US School Grades 7-12) to explore the protective factors that help female victims of sexual abuse to overcome the vulnerability (to a number of factors including suicide) associated with this. They found that those with a history of sexual abuse had a significantly higher suicidal involvement (defined as past suicide attempts) (30.5%) than controls (16.6%). There was evidence that protective factors, including a perception of themselves as healthier than others, mitigate against negative outcomes. (Other protective factors from this study are reported below.) In another cross-sectional study, Tomori (2003) used school-based survey data (n=200) to explore the role of sport in relation to self-reported suicide attempts among adolescents, specifically examining sport and physical activity as possible protective factors in relation to Slovenian adolescent (14-19 years old) suicide attempts. Key findings included: among girls and boys, the attitude towards sport as a healthy activity was associated with lower likelihood of suicidal behaviour; among girls, non-attempters turned to sport as a coping behaviour in distress more frequently than attempters, and among boys non-attempters reported a significantly higher frequency of engagement in sport and physical activity than attempters. However the authors caution against these findings being interpreted in a way that allows engagement in sport to be used as a predictor for suicidal behaviour amongst adolescents and advise careful assessment of potential confounding variables.

3.72 There is some evidence that an attitude towards sport as a healthy activity and participation in sporting activity is protective against suicidal behaviour among adolescents. A perception of yourself as healthier than others may be protective against suicide among females who have experienced sexual abuse.

Psychosocial-level factors: family relationships

3.73 Eleven studies investigated the role of a range of aspects of family-based relationships as protective factors against suicide. Most of the studies focused on the experiences of adolescents.

Adolescents

3.74 Using a case-control study design (n=64), Israelashvili et al (2006) explored whether suicidal behaviour among female adolescents (12-18 years) in the USA, attending medical emergency rooms because of first-time suicidal behaviour, is an imitation of their mothers' tendency to escape active and problem-focused coping. The paper suffers from a lack of methodological detail (e.g. was group matching taken into account in the statistical tests?) and misreporting of results. A significant difference between suicidal and non-suicidal (control) subjects was found on only one of the 14 COPE (multidimensional coping inventory) scales. There were no significant differences between mothers of suicidal adolescents and mothers of controls on the COPE scales, nor between adolescent groups in the Active Coping Test (ACT) mean score. There were three significant correlations between suicidal adolescents' and their mothers' scores on three COPE items (one of which was negative) and six significant correlations between non-suicidal adolescents' and their mothers' scores on six COPE scales (all positive). Significant between-group differences in the size of the correlation were found for eight items; in six of these the correlation was higher in the control group. The results do not support the study hypothesis.

3.75 In a UK based cross-sectional survey of a sample (n= 2560) of 14-18 year olds in schools and youth groups, Flouri and Buchanan (2002) tested the hypothesis that perceived parental involvement is negatively associated with self-reported suicide attempts in adolescence, after controlling for both risk and protective factors. Their findings suggested that adolescents who reported higher parental involvement, characterised by a number of factors including emotional support, engagement, responsibility and accessibility, were less likely to have made a suicide attempt. This effect was not weaker when family structure had been disrupted than when young people lived in intact two-parent families.

3.76 Chandy, Blum and Resnick (1996), also reported above, explored the protective factors that help adolescent female victims of sexual abuse to overcome the associated vulnerability to a number of factors including suicide. Living with biological parents who cared about them was identified as a protective factor for this group. In a later case-control study, Chandy, Blum and Resnick (1997) took a sub-sample (n=740) of boys reporting to have been sexually abused, and a control group from participants in the National Longitudinal Study of Adolescent Health (US School Grades 7-12), to explore the factors which protected against vulnerability to a number of factors including suicide. They found that, while sexual abuse is associated with a higher risk of negative behaviours (including suicidal behaviour), this is mitigated by protective factors, the most powerful of which were maternal education beyond high school and the perception that their parents cared about them.

3.77 Husler, Blakeney and Werlen (2005) carried out cross-sectional research in Switzerland with a sample (n=1028) of 'at risk' adolescents (e.g. school drop-outs and substance misusers) to test a model of adolescent risk and protective factors including mental

illness, suicidality, use of tobacco, alcohol and cannabis, and secure self and family relations as interacting outcome measures. For girls good relationships with their families and good parental relationships were found to be marginally protective against suicide.

3.78 Svetaz, Ireland and Blum (2000) carried out in-depth interviews with a sub-sample (n=1301) of those who participated in the National Longitudinal Study of Adolescent Health to identify differences in emotional well-being among adolescents (US School Grades 7-12) with and without learning disabilities, and to identify risk and protective factors associated with emotional distress. Adolescents with learning difficulties who had experienced emotional distress reported eight times the number of suicide attempts than those without emotional distress. Family connectedness was associated with lower suicide risk.

3.79 O'Donnell et al (2004) set out to explore and understand the growing problem of suicidality (suicidal ideation and suicide attempts) in African-American and Latino teenagers (average age of 17) through a questionnaire to a sample (n=879) of school pupils from deprived backgrounds. They found that family closeness was a strong protective factor against suicide attempts.

War Veterans

3.80 Benda (2003) attempted to determine which factors discriminate between homeless, substance-misusing Vietnam veterans who were non-suicidal, those who had suicidal thoughts, and those who had attempted suicide. A sample of (n= 600) was recruited from those attending a substance misuse facility for veterans. Data were collected on several factors based on attachment theory, including caregiver attachment, sexual abuse, physical abuse, resilience, self-efficacy, and self-esteem. A range of protective factors were found among those who were non-suicidal homeless substance abusers, one of which was 'caregiver attachment'.

Adult women

3.81 Meadows et al (2005) (also reported in the individual protective factors section above) found that high levels of social support from family was a main protective factor against suicide attempts among economically, educationally and socially disadvantaged African-American women (18-59 years) who had experienced recent intimate partner violence and attempted suicide and a control group. Those with high levels of social support from their family were less likely to have attempted suicide than those with low social support.

3.82 Two studies examined the protective role of having children for women. Driver and Abed (2004) used records of completed suicides (n=60) in Rotherham (UK) to assess the effect of having offspring, dependent offspring (<18 years), non-dependent offspring (>18 years) and no offspring, on suicide rates in women. The results provided evidence that having children, per se, does not protect against suicide but that having dependent children living at home (< 18 years) and children over 18 years of age living at home mitigated against the risk of suicide. This protective effect is lost when the offspring leave home. In another study by Cooperman and Simoni (2005) which explored the prevalence, timing, and predictors of suicidal ideation and attempted suicide in a sample of HIV-positive women (over 18 years of age) in New York City, there was no evidence of the protective effect of

having children. Contrary to Cooperman and Simoni's original hypothesis, those with children were significantly more likely to attempt suicide than those who did not

3.83 Chesley and Loring-McNulty (2003) (also reported above) found that personal relationships (22% of sample) and children (18% of sample) were factors that protected against repeat suicide attempts.

3.84 Good relationships with parents mitigate against suicide risk, especially in adolescents and including those who have been sexually abused. Positive family relationships also provide a protective effect for adolescents including those with learning disabilities. Further evidence suggests that positive maternal coping strategies can have a protective effect on female adolescents. Having children living at home is protective against suicide for women; however, another study indicates that this protective effect may not exist among women who are HIV-positive.

Psychosocial-level factors: marriage and partnership

3.85 Five studies provide evidence on the protective effect of the commitment of marriage and same sex partnerships.

3.86 Using completed suicide data (n=25476) from regional, national and urban (Austria, Belguim, Denmark, Finland, Switzerland, Turin, Madrid and Norway) longitudinal mortality registers linked to census data, Lorant et al (2005) explored whether being married is protective against socio-economic inequalities in suicide, and whether any such buffering effect varies between countries. Being married had a buffering effect against inequalities in suicide risk arising from low educational qualifications (except for those 65 and over) and among those who do not own their houses. The buffering effect of being married was stronger among men than among women. The protective effect of marriage was not affected by the level of social capital at the country level.

3.87 Nisbet (1996) undertook a secondary analysis of epidemiological data (n=16477) to evaluate whether a model of social support could help explain the low suicide rate of Black females over 18 years of age in the USA. The research used data from a cross-sectional US study of the incidence and prevalence of major psychiatric disorders and the utilisation of health and mental health services undertaken between 1980 and 1985. Women had a higher suicide attempt rate than men, but the difference between black women and white women was not significant. The authors also modelled the data to examine the relationship of background characteristics including marital status and the number of children on attempted suicide as mediated by emotional state. Marriage was found to have a protective effect, but the effect was stronger for white females than for black females. Seeking support from friends and family was also found to be protective.

3.88 Kraut and Walld (2003) set out to compare the relationships of unemployment, part-time work, non-labour force participation, and full-time work with attempted suicide among residents of Manitoba, Canada aged 15-64 who made use of health services (n=43,188). The results related to employment are reported below in the employment section. Other results relevant to this section on marriage include the findings that residential stability and marriage were protective against suicidal behaviour.

3.89 Benda (2003) attempted to determine which factors discriminate between homeless, substance misusing veterans who were non-suicidal, those who had suicidal thoughts, and those who had attempted suicide (n=600). A number of protective factors were found (see employment, religion and parental relationships), including the commitment of marriage.

3.90 Mathy, Kerr and Lehmann (2003) used survey data (n=38,204) to explore the combined effects on mental health of marriage as a protective factor and homosexuality as a risk factor in USA and Canada. They found a significant association between suicidality and sexual orientation in both countries, with homosexual and bisexual people being at higher risk of suicide ideation and attempts than heterosexual people. Marriage appeared to mediate this risk in some, but not all, instances. Relationship status was only significant in protecting against suicide attempt among US and Canadian men, but not among Canadian or US women. The authors point out that married men were less likely than non-married men to have problems with drugs, sex and gambling and having used or currently using psychiatric medication.

3.91 Marriage is a protective factor against suicide (although more so for white females than black females in the USA). There is also evidence that marriage has a buffering effect against socio-economic inequalities found in suicide, particularly for men. Homosexual and bisexual people are at higher risk of suicide ideation and attempts than heterosexual people. and marriage-like partnership was found to be protective of homosexual men and not women. It is important to consider other confounding variables including the finding that married men were less likey than non-married men to have problems with drugs, sex, gambling and having used or currently using psychiatric medicine.

Psychosocial-level factors: social relationships and social connectedness

Positive school experiences and school connectedness

3.92 A number of studies explored protective factors related to a sense of social belonging and connectedness often arising from a combination of social sources, emphasising the need to understand protective factors against suicidal behaviour as interactive social processes.

3.93 Kidd et al (2006) explored the impact of social relations on suicide attempts in a longitudinal study of adolescents (grades 7 -11, mean age of 16) in the USA (n=9142). Adolescents who felt more connected to their parents were less likely to commit suicide (OR = .60 (no CIs stated)). Parent relations were the most consistent protective factor, and among boys with prior suicide attempts, school relations augmented the effects of parent relations when peer relations were poor. Similar findings were gained in a study by Pharris, Resnick and Blum (1997) which sought to identify factors which protect against the adverse health correlates of sexual abuse (including suicide) in reservation-based American Indian and Alaskan Native adolescents (12-21 years) using a cross-sectional school based survey. Factors associated with an absence of suicide attempts for females were family attention, parental, family, and adult caring, parental expectations that were not too high, and belief that school people care. For males, the only factor associated with absence of suicide attempts was family attention.

3.94 Svetaz, Ireland and Blum (2000), previously reported in the section on 'good family relationships', found school connectedness to be associated with lower suicide risk among adolescents with learning disabilities.

3.95 Chandy, Blum and Resnick (1996), also reported above, explored the protective factors that help female victims of sexual abuse to overcome the associated vulnerability to a number of factors including suicide. The presence of a school nurse or clinic was one of a number of protective factors identified. In a later study, Chandy, Blum and Resnick (1997) took a sub-sample (n=370) of boys reporting to have been sexually abused and a control group (n=370) from participants in the National Longitudinal Study of Adolescent Health (US School Grades 7-12) to explore the protective factors that help male victims of sexual abuse to overcome the vulnerability to a number of factors including suicide. They found that a perceived supportive school was a protective factor against suicidal behaviour.

3.96 Two studies examined the experiences of adolescents identifying as lesbian, gay, bisexual or transgendered (LGBT). The combined protective effect of family and school was also found by Eisenberg and Resnick (2006) who examined the association between four protective factors (family connectedness, teacher caring, other adult caring, and school safety) and suicidal ideation and attempts among gay, lesbian and bisexual (LGBT) young people in the US using a cross-sectional survey design (n=2255). The study found that those identifying as LGBT reported significantly lower levels of each of the protective factors examined than their non-LGBT peers. LGBT as a suicide risk factor is significantly mediated by the protective factors of family connectedness, adult caring, and school safety.

3.97 Fenaughty and Harre (2003) explored resiliency to suicide among young (under 26 years of age) gay men in New Zealand recruited to a small scale (8 participants) qualitative study through 'youth networks'. Fenaughty and Harre describe a complex interplay between risk and resiliency for this risk group ('seesaw' model), with perceptions of gay sexual orientation as the pivot. Important factors that participants felt contributed to increased resiliency to suicidality included positive stereotypes or representations of gay men, positive family acceptance of homosexuality, GLB friendly schools and school peer support, gay support network participation, high self esteem gained through having a positive perception of gay sexuality and coping mechanisms such as problem-solving coping. According to Fenaughty and Harre, 'coming out' is one of the most stressful experiences for gay youth and this study demonstrates that differences in suicidality may be more related to the amount of resiliency that individuals have than the amount of stress they experience. This is similar to observation by Malone et al (2000) that resiliency to stressful life events is a better predictor of suicide than the amount of stressful life events experienced.

3.98 Supportive school environments, including access to health care professionals at school are important protective factors among adolescents including those who have experienced sexual abuse, those with learning disabilities and those who identify as lesbian, gay, bisexual or transgendered.

General social support

3.99 The protective effect of social support against suicide was explored in a number of studies which cover a diverse range of population groups.

3.100 In a small-scale (n=13), qualitative study of resilience among suicidal female adolescents (15-24 years) Everall, Altrows and Paulson (2006) set out to understand how these adolescents had overcome their suicidal feelings (n=7 had attempted suicide). The authors found four main domains of resilience. Three of these (purposeful and goal directed action, cognitive processes and emotional processes) are reported in individual-level factors section above. The fourth domain was 'social processes', that is, a significant relationship that provided social support, usually within a social setting with which respondents felt a sense of belonging.

3.101 Two US-based studies explored protective factors among black Americans. Kaslow et al's (2005) hospital clinic-based case-control study examined the effect of several potential risk factors (life hassles, partner abuse, partner dissatisfaction, and racist events) and potential protective factors (effectiveness of obtaining resources, social embeddedness, and social support) for suicide attempts among a sample (n=200) of adult (18-64) African-American suicide attempters and a control group of non-suicide attempters. They concluded from their results that suicide attempter status could be predicted by two independently significant social variables, including one risk factor, life hassles, and one protective factor, social support. Nisbet (1996) undertook a secondary analysis of epidemiological data to evaluate whether a model of social support could help explain the low suicide rate of Black females over 18 years of age in the USA (reported in the marriage section above). Seeking support from friends and family was found to be protective against suicide attempt.

3.102 Coker et al (2002) undertook a cross-sectional study of a sample of female victims of domestic abuse seeking medical help (n=1152). The study aimed to determine associations between intimate partner violence (defined as sexual, physical, or psychological abuse) and mental health outcomes, and to assess the protective roles of abuse disclosure and social support on mental health among abused women. Coker found that higher levels of social support reduced the risk of adverse mental health outcomes among the abused women by almost one half, and higher social support scores were associated with reduced risk of suicide attempts.

3.103 Donald et al (2006) investigated risk and protective factors for medically serious suicide attempts among young Australian adults (18-24 years) in a case control study (also reported above in the individual-level protective factors section). The findings revealed a trend towards social connectedness being more protective of those with high depressive symptomatology than those with low depressive symptomatology and among smokers rather than non-smokers. Immediate family support was not found to be protective against medically serious suicide attempts.

3.104 In a study of African-American women (reported above) Meadows (2005) found that those with high levels of social support from friends, were less likely to attempt suicide than those with low levels of social support.

3.105 Social support and connectedness in general is protective against suicide among a range of population groups, including black Americans and women who have experienced domestic abuse, young adults with severe depression and smokers.

Psychosocial-level factors: religious faith and spirituality

3.106 One systematic review and thirteen primary studies explored religious faith and spirituality as a protective factor against suicidal behaviour. This section is reported under the main themes of religious participation, moral objections to suicide and differentiating factors *within* religious groups.

Religious participation

3.107 Van Ness and Larson (2002) conducted a systematic review of the evidence concerning religiosity/spirituality and mental health in persons over 65 years of age. We report the section of these results that linked religious participation/observance to suicide rates. One of the included studies attempted to explore critically Durkheim's theory of religion as an aspect of 'organic solidarity'. The study found that the percentage of residents in a region participating in religious organisations was inversely proportional to the rates of suicide in that region. A further two studies contributed to this evidence, with one of these distinguishing between family support and that provided by religious organisations as they recognised that social integration could be a confounding factor. However, yet another study included in the review found that religious involvement and suicide had a non-significant association when measures of social integration were added to the multivariate regression models.

3.108 Tubergen, Grotenhuis and Ultee (2005) also set out to explore critically Durkheim's study of suicide, particularly to investigate the support provided by religious networks and/or religion-based moral sanctions on suicide. This cross-sectional study used data from the Netherlands (1936-73) of Catholic, Protestant and non-churchgoing suicide completers (n=14744). They found that suicide rates decreased among populations with rising proportions of church attendees in a community.

Moral objections to suicide

3.109 The study above provides evidence for the community norms theory: that high levels of church attendance is associated with strong prohibitions against suicide across the whole community (rather than among only those attending church). The community norms hypothesis was also tested by linking suicide rates to the overall decline in church attendance over time. Findings suggested that religious communities have a protective effect because of the prohibition on suicide, but with increasing secularisation and the waning of religious participation, community norms related to the religious community are losing impact.

3.110 Three further papers provided supporting evidence that religious participation/religious communities can generate protection against suicide because of the moral sanctions on this behaviour. In a cross-sectional study in the USA, conducted with Latinos and non-Latinos with a diagnosis of major depression, bipolar disorder or

schizophrenia from 18-80 years of age, Oquendo et al (2005) (also reported above) found that Latinos were less likely than non-Latinos to have made lethal suicide attempts and scored much higher than non-Latinos on the Reasons for Living Inventory (which included a moral objections to suicide factor). In a psychiatric hospital-based case control study (n=357) Dervic et al. (2006) explored the potentially protective role of moral objections to suicide against suicidal behaviour in patients with cluster B personality disorders (CBPD) or depression. They found that moral objections to suicide or religious beliefs may have a protective effect against suicidal behaviour in depressed patients with co-morbid cluster B personality disorder, as suicide attempters were less likely to have religious affiliation than non-attempters. One further study (Malone et al, 2000, also reported above) suggests that moral objections to suicide may lead to less lethal methods of suicide attempts. In exploring the lethality of attempts, moral objection to suicide was the only reason for living that was significantly stronger in the subjects with low-lethality suicide attempts than in those with high-lethality attempts.

3.111 Four studies included religious participation or spirituality as a protective factor against suicidal behaviour among a range of other factors. Each dealt briefly with this topic and did not investigate what role religion might play in the lives of participants or which aspect of religious participation offered protection against completed or attempted suicide. Svetas, Ireland and Blum (2000) carried out interviews with adolescents (USA school grades 7-12) with and without learning disabilities (also reported above). Religious identity was associated with lower risk of suicide. This was also the case in another USA study (Chandy, Blum and Resnick, 1996, also reported above) of girls who had been sexually abused, in which spirituality or religious participation was found to protect against that higher risk. A study of homeless, substance misusing veterans drew on a resilience approach to determine which factors distinguished those who had and had not attempted suicide (Benda, 2003). The author found multiple protective factors, including religiosity, were associated with the resilient group. Meadows et al (2005), reported above, found spirituality protective against suicide among African-American women who had experienced inter-partner violence. Those with high levels of spiritual well-being were less likely to attempt suicide compared with those with lower levels of spiritual well-being. Finally, Chesley and Loring-McNulty (2003) (reported above) found that 14% of their participants reported spirituality to be a factor that protected against repeat suicide attempts.

3.112 A further four studies which explored the role of religious faith and spirituality as a protective factor demonstrated no evidence of reduced risk of suicidal behaviour related to religious participation or spirituality. These studies covered a diverse range of population groups, including abused women (Coker et al, 2002), HIV-positive women (Cooperman and Simony, 2005), lesbian and bisexual women (Mathy and Schillace, 2003) and Inuit youth in Canada (Kirmayer, Boothroyd and Hodgins, 1998). In the latter study, church attendance ceased to be significant as a protective factor when psychiatric illness was included in the analysis.

Differentiating factors <u>within</u> religious groups

3.113 As Kirmayer et al's (1998) study suggests, the protective effect demonstrated by this field of study may include multiple underlying factors at play beyond simply adherence to religion or being an active member of a religious group. A study involving North American First Nations (Garroutte et al, 2003) showed that there may be interplay between different

religious forms observed by members of the same community and that it is necessary to look more closely at these in order to attribute protective effects. Drawing on data (n=1465) from the American Indian Service Utilization, Psychiatric Epidemiology, Risk and Protective Factors Project, the cross sectional study distinguished between participation in Christian churches and participation in ritual/cultural practices associated with American Indian traditions. Those with a high level of American Indian ritual/cultural orientation had a reduced prevalence of suicide compared with those with low level of ritual/cultural orientation; there was no association between Christian practice/affiliation and suicide attempts. According to the authors, these results suggest that a positive cultural identity may be protective against suicidal behaviour in American Indian populations.

3.114 Nonnemaker, McNeely and Blum (2003) explored the association between public and/or private domains of religiosity and a range of health-related outcomes, including suicidal behaviour, among adolescents (school grades 7-12). They used existing data from the Longitudinal Study of Adolescent Health to identify a sample of adolescents who had expressed some religious affiliation (n=16306). Public religiosity was defined as church attendance or participation in church organised groups, while private religiosity was considered to be individual, private prayer. While public religiosity was associated with lower emotional distress, private religiosity was not. Private religiosity was significantly associated with a lower probability of having had suicidal thoughts or having attempted suicide, while public religiosity was not.

3.115 Distinctions between the protective effects of different forms of religious observance were also explored in a cross sectional study by Molock et al (2006). The study questioned whether involvement in public religious observance and using different religious coping strategies protected African-American teenagers (13-19 years) from suicidal behaviours using a school-based sample (n=212). Different styles of religious coping, based on the model of Pargament et (1988)[4] model, were identified: self-directed coping, where the person is active in problem solving and God/'Higher Power' is passive; collaborative coping style, where the individual involves God as a partner in problem solving; and deferred coping, where the person is passive and expects God to solve their problems. A person might draw on all three styles at different times depending on the context/stressor. There was a significant relationship between self-directed coping and suicide attempts: those using this style were more likely to report having attempted suicide than those using other types of coping. According to the authors the results may indicate that increased church attendance and church involvement have an influence on coping style and thereby represent a protective factor.

[4] Pargament, K.L., Grevengoed,N, Kennell, J,Newman, J, Hathaway, W & Jones, W. (1988) 'Religion and the problems solving process: three styles of coping', *Journal for the Scientific Study of Religion*, Vol. 27: pp 90-104.

3.116 There is a wide range of evidence to suggest that religious participation may be a protective factor against suicidal behaviour. However, this may vary according to the level of secularisation within a country or community. Moral sanctions against suicide promoted by members of a religious community may have wider protective effect on the non-religious members of a community where the religious members are in the majority. Religious observance does not confer equal protection on individuals. Other factors, such as the observance of traditional cultural rituals, may have a stronger protective effect. The manner in which individuals relate to their God (in terms of religious coping style or private versus public expressions of religiosity) may further highlight different levels of protective factors within a single religious community.

Employment

Three studies provide research evidence on the potential of employment as a protective factor against suicide and suicidal behaviour.

3.117 Kraut and Walld (2003) carried out a cross-sectional study to compare the relationships of unemployment, part-time work, non-labour force participation, and full-time work with attempted suicide among residents of Manitoba, Canada aged 15-64 who made use of health services (n=43188). Unemployment was associated with a higher likelihood of attempted suicide and those who worked part-time (1-15 weeks, 26-51 weeks) and those not working at all had an elevated likelihood of attempted suicide when compared to those working 52 weeks (that is, full time). These findings suggest that full-time employment is protective against suicide attempts.

3.118 Benda (2003) attempted to determine which factors discriminate between homeless, substance misusing veterans who were non-suicidal, those who had suicidal thoughts, and those who had attempted suicide, this study is also reported above. A number of factors were found to be protective among those who were non-suicidal homeless substance abusers, including employment.

3.119 Cooperman and Simoni (2005) (reported above in 'having children' section) set out to explore the prevalence, timing, and predictors of suicidal ideation and attempted suicide in a sample (n=207) of HIV-positive women (over 18 years of age) in New York City. Contrary to the authors' original hypothesis, those who were employed were significantly more likely to attempt suicide.

3.120 There is some evidence that employment, especially full-time, has a protective effect against suicide. However, employment was not found to be protective among women who were HIV-positive.

Exposure to suicidal behaviour

3.121 Mercy et al (2001) carried out a case control study in the USA to determine the association between nearly lethal suicide attempts and exposure to the suicidal behaviour of parents, relatives, friends, or acquaintances and to accounts of suicide in the media in a sample of young people (13-34 years of age) who had attempted suicide and non-attempters (n=666). The authors found that, although exposure to the suicidal behaviour of a parent or a non-parent relative was not significantly associated with nearly lethal suicide attempts, both exposure to the suicidal behaviour of a friend or acquaintance and exposure to accounts of suicidal behaviour in the media (i.e., having seen any movies, watched any television shows or videos, read any news articles, or read any books or stories during the 30 days prior to the suicide attempt for case subjects or interview for control subjects) were associated with a lower risk of nearly lethal suicide attempts.

3.122 The authors note that these findings are contradictory to many previous studies which have found exposure to media accounts to be a risk factor and suggest a number of potential explanations for their finding. These include that the study was conducted at a time when the nature of media stories or popular perceptions about suicide had changed from that of earlier research, that at the time of their study media stories may have portrayed suicide in more realistic and less glamorous terms, that they examined the effects of media exposure over a 30-day interval, rather than immediately after exposure which may have more of a risk impact or that suicide attempters are more socially isolated than other people and may be likely to be exposed to suicide models in their social networks or in the media. It is important to recognise that there is a growing body of research based evidence of the risk factors associated with media reporting of suicidal behaviour such as the review by Stack (2003) 'Media Coverage as a Risk Factor in Suicide' and that by Hawton and Williams (2001) 'The connection between media and suicidal behaviour warrants serious attention.' Unfortunately these reviews were not reported as systematic reviews and could not be critiqued as part of the review of reviews for risk factors in this report. The Hawton review, although focussed on the risks of media reporting does indicate that responsible approaches to the portrayal of suicidal behaviour in the media, that is, voluntary restraints on reporting suicides by specific lethal methods have been shown to result in statistically significant reductions in deaths by those methods can save lives, a finding that is not at odds with that of Mercy et al.

3.123 One study found that exposure to accounts of suicidal behaviour in the media and, to a lesser extent, exposure to the suicidal behaviour of friends or acquaintances may be protective against nearly lethal suicide attempts. However, it is important to note that there is also a body of evidence of the suicide risks associated with media reporting.

Social values

3.124 Lam et al (2004) examined specific individualistic and traditional values in the context of suicidal ideation and behaviours in Hong Kong among adolescent youths (14-18 years) through a cross sectional school survey (n=2427). Among both boys and girls who attempted suicide but did not require medical attention, those who endorsed individualistic values were less likely to make a serious suicide attempt. However, when controlling for family relationships and symptoms of depression, the value of individualism had no influence

on girls' suicidal behaviour, while the value was associated with lower rather than higher risk among boys. The reverse was true for the traditional values of obedience and respect for elders, which was protective among girls but not among boys.

3.125 Traditional social values may have a protective effect against suicidal behaviour among adolescent girls, while individualistic values may have a protective effect among adolescent boys.

Access to treatment by a health professional

3.126 Chesley and Loring-McNulty (2003) (also reported above) found that when their sample was asked 'Has someone or something made a difference in keeping you alive?' 15% of the sample stated that treatment by a health professional was one of a number of factors that protected them against repeat suicide attempts.

3.127 Access to treatment by a health professional may be protective against repeat suicide attempts.

Importance of recognising the presence of multiple protective factors

3.128 Fergusson (2003) examined factors that influenced both the vulnerability and resiliency to suicidal ideation and suicide attempt among depressed young people (15-21 year olds) with depressive disorders in New Zealand (n=1063). Participants were selected from those involved in Christchurch Health and Development Study, which was a longitudinal birth cohort followed over a 21 year period. The majority of their sample did not go on to attempt suicide, leading the authors to conclude that vulnerability and resiliency to suicidal behaviour among their participants was influenced by a complex interplay of factors. These included having a family history of suicide, a history of childhood sexual abuse, personality factors, peer affiliations and success at school. Positive aspects of these factors appeared to enhance resiliency, whereas negative configurations increased vulnerability.

3.129 The interplay between a number of risk and protective factors at individual and psychosocial levels must be taken into consideration when attempting to understand which factors promote resiliency and vulnerability to suicide and suicidal behaviour.

CHAPTER FOUR DISCUSSION

Modelling the interplay between risk and protective factors in suicidal behaviour

The complexity and challenges of developing a comprehensive model

Broad scope of the evidence

4.1 The scope of the evidence presented in this review demonstrates the complex nature of obtaining and presenting knowledge about the determinants for suicide and suicidal behaviour. The complexity arises from the need to address the individual, psychosocial and societal levels of determinants, taking cognisance of the addition of co-morbidities and/or the combination effect of multiple risk and protective factors and of risk and protective factors within high risk groups. Additionally, gaps in the literature make the potential for modelling this complexity even more difficult when evidence and knowledge is limited to particular populations or sub-groups. For example, it is difficult to model risk factors across the human life course or for specific risk groups because much of the risk evidence available at review level is based on general adult populations such as the evidence on mental ill health.

Evidence based on variable samples

4.2 There are different risk factors for fatal and non-fatal suicidal behaviour, although it is often difficult to find a clear distinction within and across review studies, (see para. 1.16). It is also the case that risk factors identified in studies of fatal suicides will also appear as risk factors in studies of suicide attempters. Much of the evidence on protective factors is based on studying suicide attempters. Only 3 studies (Driver, 2004; Lorant, 2005; Tubergen 2005) include data on fatal suicides, primarily because they are studies of risk factors which also discuss protective factors, whilst much of the evidence on risk factors is conducted on suicide completers or both completers and attempters. In some instances, such as the association between unemployment and suicide, the risk factor identified applies to both fatal and non-fatal (DSH) suicidal behaviour.

4.3 A further complexity in modelling the evidence is that factors found to be protective in the general population or some specific populations do not appear to apply to other specific populations. For example, in relation to the generally supportive evidence for religious faith and spirituality as being protective against suicidal behaviour, this is not upheld for abused women (Coker et al, 2002), HIV-positive women (Cooperman and Simoni, 2005), lesbian and bisexual women (Mathy and Schillace, 2003) and Inuit youth in Canada (Kirmayer, Boothroyd and Hodgins, 1998). Additionally, some buffering effects from protective factors may be stronger for some groups than for others, for example, marriage has a stronger buffering effect for males than it has for females (Lorant, 2005). This places limitations on the extent to which generalisations can be made, particularly from the protective factors primary studies.

Approach to modelling

4.4 The models presented reflect the general findings of this review in relation to risk and protective factors but also include exceptions to the general pattern of evidence. Where possible, the model also indicates where evidence is based on fatal or non-fatal suicidal behaviour, that is, completed suicides versus suicide attempts.

4.5 Many studies on risk of suicidal behaviour point to the inverse of this risk as being protective against suicide (e.g. unemployment as a risk factor, employment as a protective factor). It is to be generally accepted that this applies to those risk factors included in the model. Although some risk factors cannot be easily prevented (e.g. first onset of symptoms in schizophrenia) there may be interventions which can help alleviate the impact of these risk factors.

4.6 The interplay between a number of risk and protective factors at individual and psychosocial levels should underpin any attempt to understand which factors promote resiliency and vulnerability to suicide and suicidal behaviour. The identification of risk factors within high risk groups demonstrates the potential for multiple risk factors to be at play, some of which present at the individual level and are associated with their risk group status (such as increasing severity of illness or rapid cycling), while some are psychosocial risk factors e.g. unemployment or bereavement. This indicates the need for particular attention to be paid to high risk groups such as those who those who have a mental illness because of the likelihood of multiple risk.

4.7 There is reasonable evidence for added benefit or reduced risk in high risk populations when multiple protective factors are at play. It is also apparent that the protective effect of some factors is lost when risk factors come into play (such as problem-solving coping strategies and hopelessness.)

4.8 The gaps in the models relate to identifying risk factors associated with different age groups and different life stages. There are also gaps in relation to risk and protective factors among marginalised groups such as those who identify as LGBT, young offenders and those in prisons, those living with chronic illness, and older people.

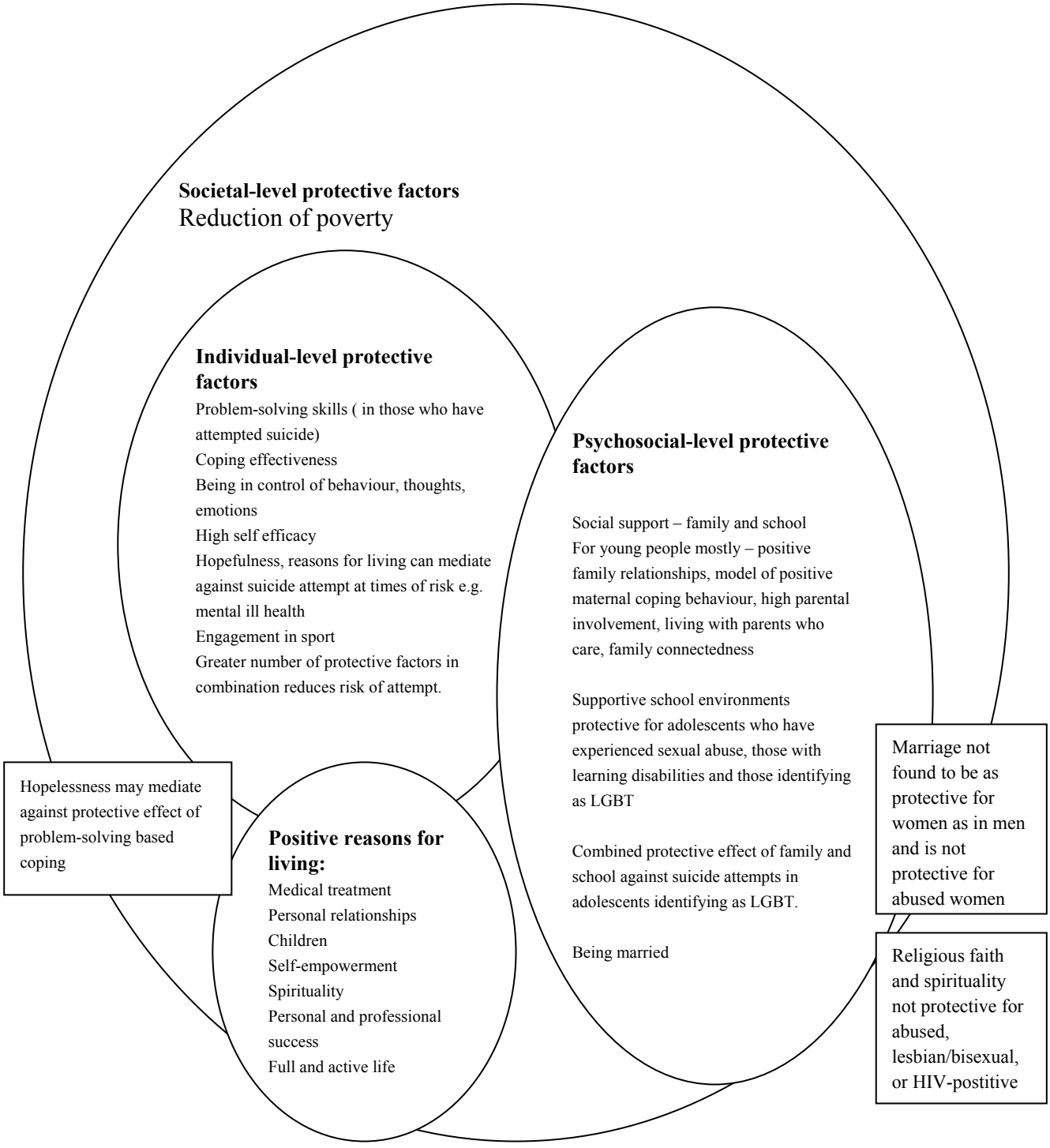
4.9 The following models are general representations of the evidence, offering a summary of the key findings of the review in terms of risk factors, risk groups and protective factors for suicide and suicidal behaviour identified through research. Three models are presented: one on protective factors, one on risk factors and one which represents the interplay between risk and protective factors within a specific high risk category (where additional risk factors can be identified within high risk groups), namely those with mental ill-health.

4.10 Model 4.1 represents the key protective factors which mediate against suicide in those who are at risk of suicide. Some of these have been identified through studies of risk in populations whilst others have emerged from studies of protective factors among risk groups (comparing suicide attempters with non-attempters within risk groups). The model presents evidence at the individual, psychosocial and societal level, with individual and psychosocial levels interacting with each other and all within the context of wider societal-level protective factors. Important exceptions to the general trend of evidence have also been included within the model.

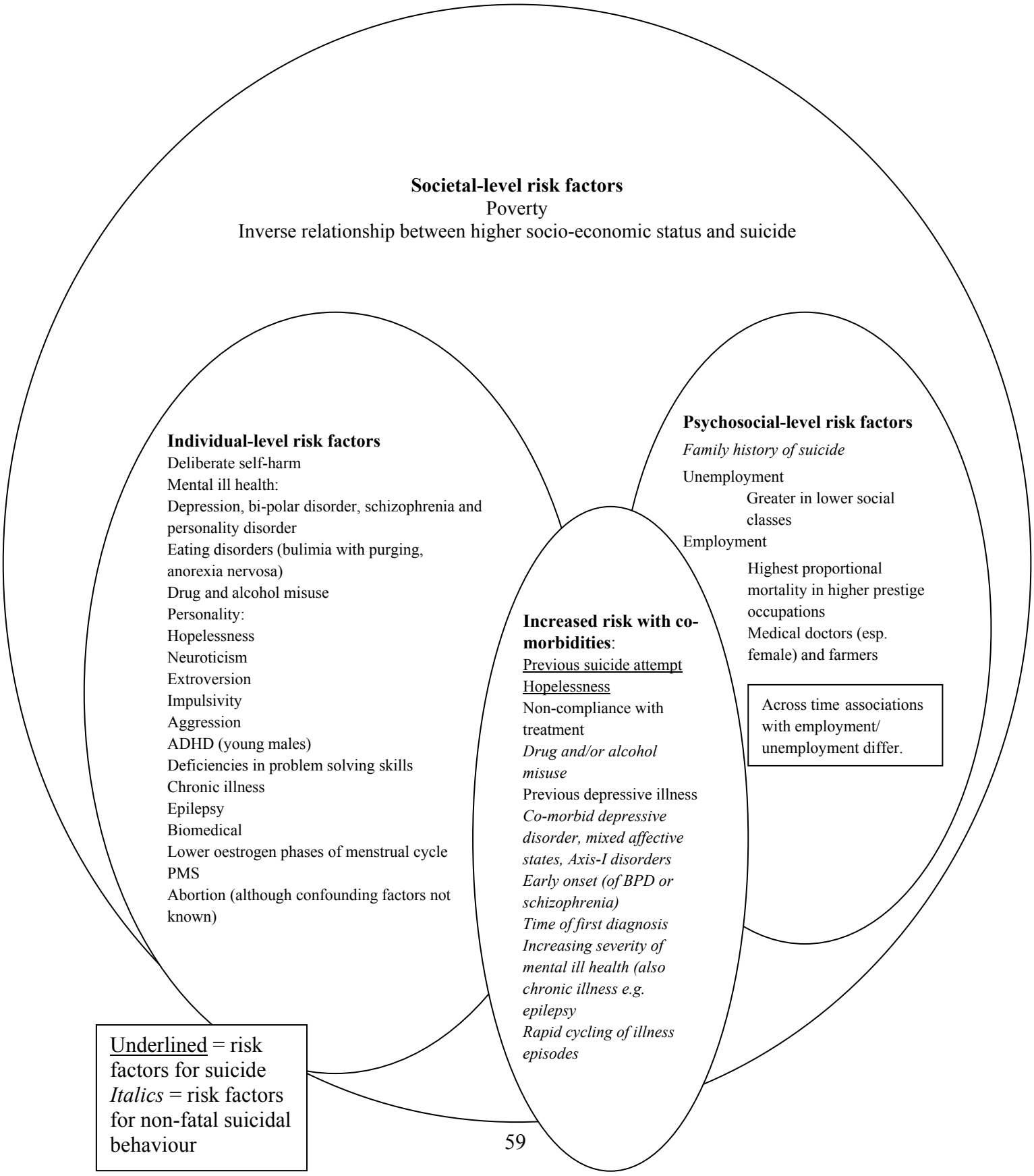
4.11 Model 4.2 represents the key risk factors for suicidal behaviour. These are presented at the individual, psychosocial and societal level, and as well as demonstrating the interplay between the individual risk factors and psychosocial risk factors within the context of wider societal influences. There is also an attempt to depict the potential for additional risk factors within risk groups, particularly in relation to co-morbidities.

4.12 Finally, model 4.3 represents the interplay between risk and protective factors for a particular high risk category namely, those with mental ill health. This demonstrates the input of evidence which is condition-specific and the evidence relating to the identification of additional risk factors within this high risk category, as well as psychosocial and societal-level risk factors which apply to the general population and to which this high risk category are also susceptible. There is little in terms of specific protective factors identified within the literature which relate specifically to this high risk group: therefore, the general evidence on protective factors within high risk groups has been applied.

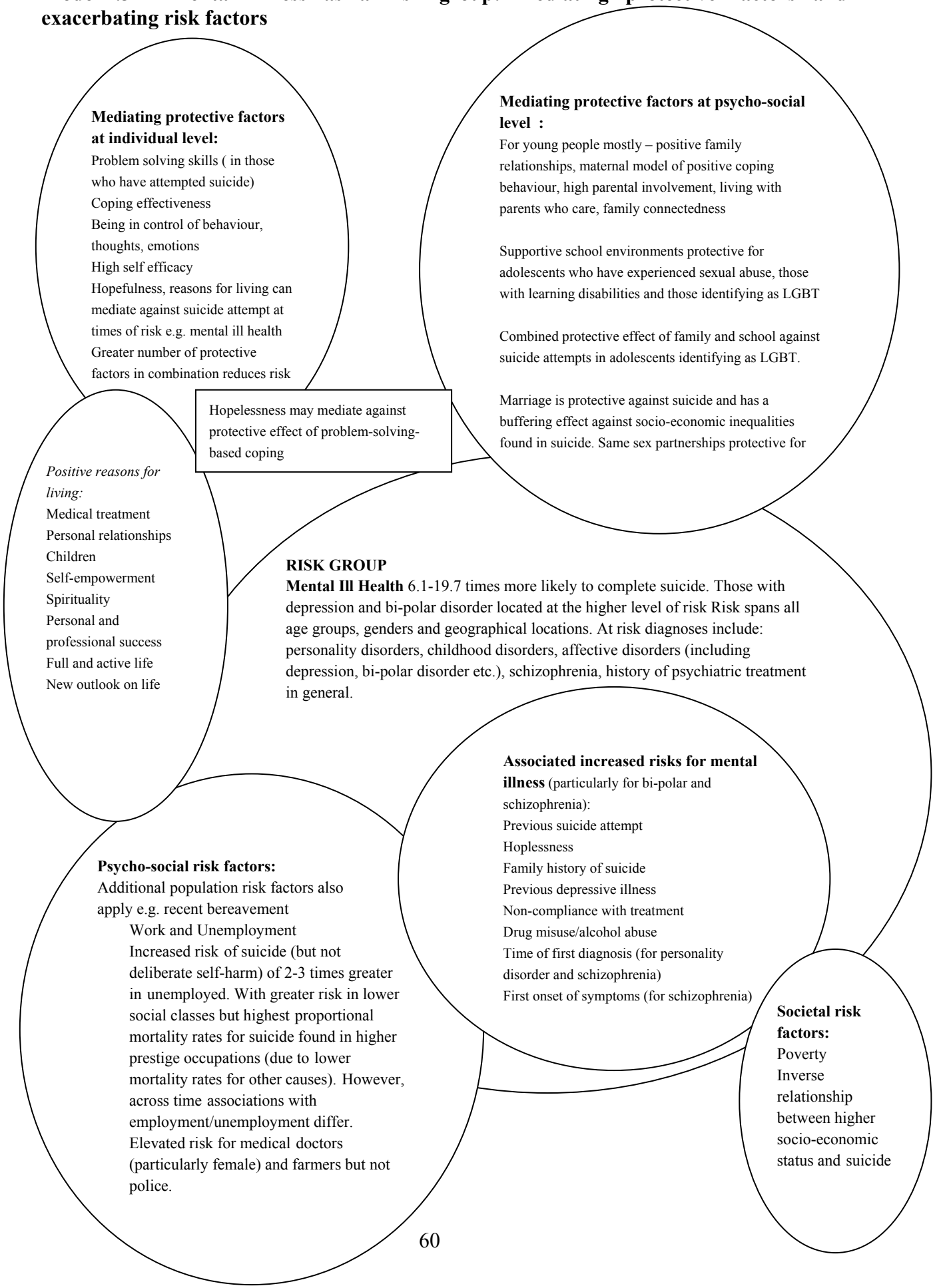
Model 4.1 Protective factors mediating against suicidal behaviour in those at risk of suicidal behaviour



Model 4.2 Risk factors for suicidal behaviour



Model 4.3 Mental illness as a risk group: mediating protective factors and exacerbating risk factors



Extent to which included studies address marginalised groups

4.13 Although many studies on risk focus on those with mental health problems and/or diagnosis, few of the risk studies specifically addressed socio-economic or cultural differences within general populations. This may be a symptom of risk studies being weighted towards completed suicide as an outcome and using population-based quantitative research designs. Rehkopf and Buka (2005) argue that one of the problems in exploring socioeconomic status in relation to suicide is that given the low incidence of suicide, when the area of aggregation of results is too large, then results between studies tend to contradict or conflict. They argue that it becomes problematic when studies conflate socio-economic status with areas or regions since there will always be variations within these. The section below on gaps in the evidence identifies a number of marginalised groups that are not included in the review level evidence on risk.

4.14 The protective literature deals with a range of different population groups, often those who are marginalised within modern UK society including those with HIV status, women who experience domestic abuse, those who identify as LGBT, homeless people and those with mental illness.

Gaps in the evidence available to this review

4.15 One of the valuable aspects of systematic review methodology is that the rigorous searching techniques identify a very high percentage of relevant literature in a given field and allow the reviewer to state with confidence where there are gaps in the evidence base lie. Prior to beginning the review, lists of risk and protective factors were devised and all of the literature found was mapped into those categories. This enabled us to clearly identify where the gaps lay.

Risk factor gaps

4.16 This review strictly includes only studies which are clearly reported as systematic review level evidence for risk factors. The gaps identified below refer to the lack of *systematic reviews on risk of suicide and suicidal behaviour within the last ten years* that address the following topic areas and / or known risk groups (see para 2.12 for references for known risk groups):

- Aggression/violence
- Being affected by aftermath of suicidal behaviour or completed suicide
- Bereavement
- Children, especially looked after children
- HIV/AIDS
- Homelessness
- LGBT
- Isolation and loneliness
- Media
- Non-help seeking
- Older people

- Prison/incarceration of young offenders
- Rural/isolated communities
- Those who have been physically and sexually abused
- Urban deprivation
- People with physical or learning disabilities

4.17 The list above re-emphasises the point that adherence to the methods of a systematic review of reviews does limit the evidence on known risk groups, (see para. 2.18). However there is a range of high quality, but not systematic, reviews of the literature conducted within the last ten years on some of the topics above such as the media (Stack, 2003, Hawton and Williams, 2001) and prisons, the Comprehensive Text Book of Suicidology (Maris, Berman and Silverman, 2000).

4.18 In order to ascertain the extent of research that might be available at the level of primary studies of risk within the above review-level gap areas, we conducted some trial searches for primary studies in two selected areas, prison and older people (see Annex 12 for details of search strategy). The purpose of this exercise was to determine the number of potentially relevant primary studies related to these two selected areas as risk factors.

4.18 For prison, a Medline search yielded a total of 70 references, 38 of which remained relevant following screening of titles and abstracts. For suicidal behaviour in the older population a Medline search retrieved 197 studies, 25 of which remained relevant following screening of titles and abstracts. For older people, the risk factors under investigation focused on mental and physical ill health such as Alzheimers, depression and schizophrenia and some medical conditions such as cerebrovascular pathologies.

4.19 These searches demonstrate that there are published primary studies related to the areas where there are review-level evidence gaps, although it is debatable whether there are sufficient studies to warrant further systematic reviews at this time.

Protective factor gaps

4.20 The following areas have been identified as potential gap areas in the protective factor literature:

- Self help
- Neighbourhood quality
- Social capital
- Older people

4.21 There are very few qualitative studies available on the topic of the determinants of suicide and suicidal behaviour. Given the multi-faceted, complex and interactive nature of risk and protective factors for suicidal behaviour, more in-depth qualitative research examining the different ways in which people cope with exposure to risk and protective factors within different communities (geographic, demographic and cultural) is a potential area for further investigation.

CHAPTER FIVE CONCLUSIONS

Relevance to and implications for Scottish policy and practice

5.1 In general terms this review confirms and substantiates much of current knowledge in terms of understanding and identifying risk factors and groups at risk of suicide and the evidence on risk factors applicable to Scottish society. It also offers some further insight into the issue of multiple risk and protective factors, although much of the risk evidence seeks to single out risk factors and groups and much of the protective factor evidence is based on studies of quite distinct population groups limiting the extent to which generalisations can be made.

5.2 The evidence in this review reinforces the current approach to suicide prevention policy in Scotland and suggests that those involved in suicide prevention policy should consider identifying strategies that:

- tackle societal and structural risk determinants that result in social injustices that lead to social and health inequalities which the evidence links to inequalities in suicide risk
- enhance individual and psychosocial protective factors in the general population (and those who are more vulnerable) that prevent them from becoming future members of suicide risk groups where possible e.g. mentally ill, prisoners, unemployed, in poverty
- focus on developing family and community connectedness
- challenge and identify ways to remove societal and institutional cultural values and beliefs that unfairly expose certain groups to elevated suicidal risk such as those who are sexually abused, LGBT, prisoners and older people
- target interventions to particular suicide risk groups taking into account the highly distinct and individual risk and protective combinations to which people are exposed to
- seek to identify mechanisms that reduce the exposure of individuals and communities to multiple risk factors
- seek to identify mechanisms that increase the exposure of individuals and communities to multiple protective factors
- support research that can increase knowledge and understanding of the complex interplay between risk and protective factors at individual, psychosocial and societal levels amongst different individuals and population groups across the life span

5.3 When considering practice and policy implications, particular attention should be paid to those exposed to multiple risk e.g. those with mental health problems. There is reasonable evidence for the added benefit or reduced risk in high risk populations when multiple protective factors are at play. This would support the development of multi-stranded strategies to strengthen protective factors, such as increasing awareness of reasons for living and problem-solving capabilities in individuals whilst promoting the development of supportive family and school environments.

5.4 The evidence in this review points to a number of priority areas for suicide prevention initiatives in health and social service through health promotion practice.

Self help

5.4 Much of the evidence on protective factors is about the individual having or gaining:

- an element of control over the kind of coping skills they employ
- they way in which they react to adverse life situations positively
- the reasons they identify for living
- optimism for the future

5.5 It is not clear how much of this is learned behaviour from parents or other role-models and how much is self-directed or innate. However there is evidence that people can change the way in which they cope to prevent reaching the stage where they attempt suicide. This lends some support to the continued development of self help for those with or at risk of developing common mental health problems and recovery-focussed services for people with diagnosed mental health problems.

Mental illness

5.6 It is well established that those diagnosed with mental health problems are at higher risk of suicidal behaviour and suicide than those without such a diagnosis, and a number of risk assessment strategies are currently in practice within NHS mental health services and the voluntary sector. However, not all people who have a mental condition become suicidal and, vice versa, not all people who feel suicidal have a mental condition. Particular attention should be paid to risk assessment and protective measures for those who are experiencing a first time diagnosis of borderline personality disorder or schizophrenia who are highly vulnerable to suicide attempts at this time. Risk assessments for those diagnosed with a mental health problem should incorporate an assessment of multiple risk factors known to elevate the risk for these individuals including reasons for living, social, emotional, educational and physical health factors.

Alcohol and drug misuse

5.7 Links between national and local suicide prevention strategists and those planning and delivering substance misuse services need to be strengthened to ensure that staff working with those who misuse substances are suicide-aware and able to intervene to prevent suicides among their vulnerable client group. In a broader sense raising public awareness of the links between drug and alcohol misuse and death by suicide, and further exploration of the emerging evidence that women may be at higher risk than men, could contribute to current preventative programmes for alcohol consumption as well as the suicide prevention agenda.

People who have attempted suicide

5.8 Again, it is relatively well known amongst care professionals and policy makers that those who self-harm have a much greater risk of dying by suicide compared with those who do not engage in this behaviour. Those who have attempted suicide should have access to treatment from health-care professionals and other supports such as self help, counselling or

cognitive therapy that can enable them to develop better problem-solving and positive coping skills and identify reasons for living.

Epilepsy

5.9 Clinical staff working with those who have epilepsy, especially temporal lobe epilepsy or those who have had temporal lobectomies or surgical resections and their carers, need to be aware of the increased suicide risk to which these individuals are exposed and the preventative and protective measures that could be implemented.

Women's health

5.10 Awareness of the increased risk of suicide among women who suffer from pre-menstrual syndrome and how to identify suicide risk and intervene to prevent suicide is essential amongst primary care professionals and those working in female institutions such as prisons.

5.11 Elevated suicide risk during pregnancy should be a key area of awareness among care professionals in primary care, in peri-natal mental health services and among women who become pregnant. A number of preventative measures could be put in place including mandatory mental health assessments and quick access to an appropriate level of support such as self help, counselling or cognitive behavioural therapy for women who experience difficulties.

5.12 Women seeking and undertaking abortion should be offered appropriate mental health and well-being supports in the short and longer-term.

Sexual abuse

5.13 Adolescents who have experienced sexual abuse are at increased risk. However, the impact of this risk can be alleviated when there are supportive social environments such as supportive families or schools. The identification of this population group may be an issue and perhaps initial strategies might involve raising awareness and recognition of potential signs of abuse so that increased supports can be initiated.

Eating disorders

5.14 The elevated suicide risk of those with eating disorders should be addressed within NHS and independent sector services that offer support to such individuals. In the first instance, efforts should be directed towards those with bulimia (with purging) and anorexia nervosa.

Personality factors

5.15 There may be increased suicide risk associated with particular individual/personality factors including hopelessness, neuroticism, extroversion, impulsivity, aggression, anger, irritability, hostility, and anxiety; attention deficit hyperactivity disorder (ADHD); and low problem-solving skills. Many of these are amenable to interventions such as cognitive behavioural therapy (CBT)-based interventions for anxiety, the development of problem-solving skills and strategies, anger management etc. Wider availability of these types of interventions, particularly for young people would prove beneficial.

5.16 The evidence also indicates that suicide prevention initiatives aimed at increasing social cohesion at a family and community level would be helpful.

Schools

5.17 The development of supportive school environments which provide access to healthcare professionals should be encouraged. These settings are likely to be particularly important for people who may feel marginalised in wider society or who are personally vulnerable such as those who have experienced sexual abuse, those with learning disabilities and those who identify as being lesbian, gay, bisexual or transgender. Widespread implementation of whole-school approaches to developing resilience and challenging social stigmas amongst pupils, parents and teachers, especially at times of transition, as well as programmes specific to suicide prevention should be considered.

Family life

5.18 The commitment of family, displayed in a number of ways from marriage and parental support to having children, appears to have a protective effect against suicide. Continued education of the public and professionals about the benefits of a stable family life and good parenting on well-being, and initiatives that support good relationship and parenting skills, will be helpful in the long-term prevention of suicides. Interventions that enhance parent/adolescent relationships and family-based therapies rather than individual-focussed services for adolescents and adults should also be considered.

Religion and spirituality

5.19 The policy and practice implications of the evidence on religious faith as a protective factor are challenging to identify. Critical approaches to the study of religion in society have moved a long way beyond functionalist approaches to religion on which many of the studies in this review are based. Critics argue that religion is not necessarily an institution that 'functions' to create 'organic solidarity' but can be a root cause of stress within families, communities and even at national levels. The rather simplistic approach to the study of religion and its impact on suicidal behaviour could indicate an inherent bias in the papers, beginning with the premise that religious faith offers a form of community support, provides sanctions against suicidal behaviour and therefore protects against this. However, clearly one might also argue that someone who has a strong religious faith and/or who is active within a religious community could nevertheless attempt suicide and then have even greater

consequences to face (such as guilt associated with breaking a religious prohibition, censure of the religious community). It is also clear that there are differences in levels of protection depending on whether one observes spiritual activities privately or publicly and there are debates over whether spirituality or faith is just another form of optimism or a mechanism through which levels of community support and cohesion are enhanced.

5.20 Further research is required to take understanding of the issue of spirituality and religion to a level where clear policy or practice implications can be identified. However, the current evidence would suggest that those who want to practice their religion or spiritual activities should be able to do so unhindered in all walks of life and in all institutions from schools to prisons as they may well gain protective effects in terms of their well-being from this.

Employers

5.21 Given the high risk of suicide among certain occupational groups such as health professionals and farmers, there is a need to develop preventive measures targeting these groups such as reducing access to means (e.g. medicines and guns) and health promotion. Awareness-raising and health and well-being promotion initiatives among employer and employee groups and associations should be a priority.

Social justice

5.22 Tackling unemployment may reduce suicide rates among those who are unemployed and those in work who may feel insecure about the job market. Occupational and socio-economic class inequalities are another source of inequality in exposure to suicide risk with those at the lower end of socio-economic status experiencing a higher risk. There is a need for awareness-raising health-improvement initiatives that focus on the impact of social inequalities on mental well-being. Health and well-being and resilience-promoting initiatives should be specifically targeted to those at the lower end of the socio-economic scale.

Media

5.23 Continuation of the current national and local initiatives to work with the media, in particular the press, to enhance the protective aspects of responsible reporting of suicide is recommended.

Challenges, limits and implications for future research

5.24 At the systematic review level, there are specific challenges in synthesising the results of primary studies exploring risk. Various limitations have been suggested by a number of authors. Poorly designed primary studies restrict the claims that can be made with the primary data (Wulsin, Vaillant and Wells, 1999), the diagnostic criteria often differs between studies exacerbating problems in combining results (ibid). Studies of completed suicide are sometimes based on very small numbers, therefore rendering quantitative findings somewhat

suspect (Fleischmann et al, 2005) and the heterogeneity between studies makes synthesis very difficult (Platt and Hawton, 2000).

5.25 Due to the complex nature of risk, developing one overall risk estimate for a whole group (e.g. schizophrenics) has limited utility. Such an approach does not take account of:

- the potential range of severity of the illness
- whether the symptoms are well-controlled or not
- whether there may be differences in risk associated with sub-categories of illness
- exposure to other non-mental illness specific risk and protective factors

5.26 Hawton's papers on the risk factors in schizophrenia and bipolar disorder (Hawton et al, 2005a; 2005b) and Pompili et al's (2005b) review of risk of suicide within epilepsy provide examples of reviews that show that while a particular illness may itself present a risk factor, this is mediated by other factors. Many of the review studies included in this review take a reductionist approach that fails to differentiate between different experiences of particular illnesses or social categories into a homogenous mass.

5.27 As mentioned earlier, there is also a lack of qualitative studies investigating suicide risk and, as Platt and Hawton (2000) argue, this is the approach that may be best suited to capturing data on complex issues such as the multi-faceted nature of resilience and risk.

5.28 There may be some utility in seeking to bring together the research evidence available in primary studies for key risk groups not covered in this review (see Risk factor gaps in Chapter 4).

5.29 The study of protective factors for suicide and suicidal behaviour tends to follow the same research design pattern as much of the risk-based research. A number of authors (Groholt, 2005, Duberstein 2004, Donald 2006) have identified a need for longitudinal studies to determine differences and commonalities in exposure to multiple risk and protective factors over the life-course.

5.30 Future research on the determinants of suicide and suicidal behaviour should also:

- address marginalised groups by building in greater ethnic and cultural diversity in samples
- explore resilience and protective factors within the context of the interaction of protective factors, adversity and risk factors rather than assume that protective factors can be identified as simply the inverse of risk
- attempt to understand the links between individual, psychosocial and societal risk and protective factors by using multi-level modelling to combine these variables in studies
- explore the individual, psychosocial and societal-level causal mechanisms behind the protective effects of spirituality
- address differences and commonalities between exposure to risk and protective factors between males and females as the determinants literature provides little evidence on why there should be different rates of suicide for males than females
- develop qualitative study designs that can provide further in-depth and individualised insights into the complexities of modelling the interplay between risk and protective factors for suicide and suicidal behaviour across the life course

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GLOSSARY

Specialised terms and abbreviations are used throughout this report. The meaning is usually clear from the context but a glossary is provided for the non-specialist reader. In some cases usage differs from that found in the literature, but each term has a constant meaning throughout the report.

Axis 1 Disorders

Classification system used to describe predominantly mood disorders such as depression or anxiety.

Case-control study

A study that compares two groups of people: those with the disease or condition (cases) and a very similar group of people who do not have the disease or condition (controls). The condition in this review would be suicidal behaviour. Researchers explore medical and lifestyle histories of the people in each group to learn what factors may be associated with the disease or condition.

Cohort study (also called longitudinal study)

A study that follows a group of people over time and assesses outcomes (such as suicidal behaviour) and particular risk factors

Confidence interval (CI)

The range within which the "true" value (e.g. size of effect of an intervention) is expected to lie with a given degree of certainty (e.g. 95% or 99%). Note: Confidence intervals represent the probability of random errors, but not systematic errors (bias).

Cross-sectional study

A study in which the presence or absence of disease or other health-related variables (e.g. suicidal behaviour) are determined in each member of the study population at a single point in time.

Deliberate self-harm

Acts of intentional self-harm, irrespective of intent to complete suicide, that do not have a fatal outcome.

Generalisability (synonyms: applicability, external validity, relevance, and transferability)

Generalisability is the degree to which the results of a study or systematic review can be extrapolated to other circumstances, in particular to routine health-care situations.

Methodological quality (synonyms: validity, internal validity, and quality)

Extent to which the design and methodology of a trial are likely to have prevented systematic errors (bias). Variation in quality can explain variation in results of trials included in systematic reviews. More rigorously designed (better 'quality') trials are more likely to yield results that are closer to the 'truth'.

Odds ratio (OR)

The ratio of the odds of an event in the experimental (intervention) group to the odds of an event in the control group. Odds are the ratio of the number of people in a group with an event to the number without an event. Thus, if a group of 100 people had an event rate of 0.20, 20 people had the event and 80 did not, and the odds would be 20/80 or 0.25. An odds ratio of one indicates no difference between comparison groups. For undesirable outcomes an OR that is less than one indicates that the intervention was effective in reducing the risk of that outcome. When the event rate is small, odds ratios are very similar to relative risks.

Para-suicide

Acts of intentional self-harm (usually with intent to complete suicide) that do not have a fatal outcome.

P-value

The probability (ranging from zero to one) that the observed results in a study could have occurred by chance. In a meta-analysis the p-value for the overall effect assesses the overall statistical significance of the difference between the population group and control groups, whilst the p-value for the heterogeneity statistic assesses the statistical significance of differences between the effects observed in each study.

Protective factor

Societal or psychosocial conditions or individual behaviours that lessen the likelihood that an individual will die by suicide.

Qualitative study

A study which uses interviews, focus groups or any other non-quantitative methodology to explore peoples' understanding and experiences of particular issues.

Relative risk (RR)

The ratio of the suicide rate in persons exposed to a risk factor relative to that in people who are unexposed.

Risk Factor

Individual behaviours, psychosocial or societal conditions that increase the likelihood that an individual will die by suicide.

Risk group

Those known to be at elevated risk of suicide and suicidal behaviour.

Standardised mortality ratio (SMR)

The standardised mortality ratio (SMR) is the ratio of observed deaths to expected deaths according to a specific health outcome in a population. The figure for observed deaths is obtained for a particular sample of a population (e.g. suicides among drug misusers). The figure for expected deaths reflects the number of deaths for the larger population from which the study sample has been taken (e.g. suicides in the total population). The calculation used to determine the SMR is simply: (number of observed deaths/number of expected deaths) x 100. An SMR of 100 indicates that the age-standardised mortality rate in the group being studied is the same as the overall population. A ratio less than 100 indicates a lower than average death rate, while a rate of over 100 is higher than average.

Statistical significance

An estimate (usually expressed as a p-value) of the probability of an association (effect) as large as or larger than what is observed in a study occurring by chance. The cut-off for statistical significance is usually taken at 0.05, but sometimes at 0.01 or 0.001. These cut-offs are arbitrary and have no specific importance.

Suicide

Death resulting from an intentional, self-inflicted act.

Suicidal behaviour

Comprises both suicide and acts of self-harm that do not have a fatal outcome.

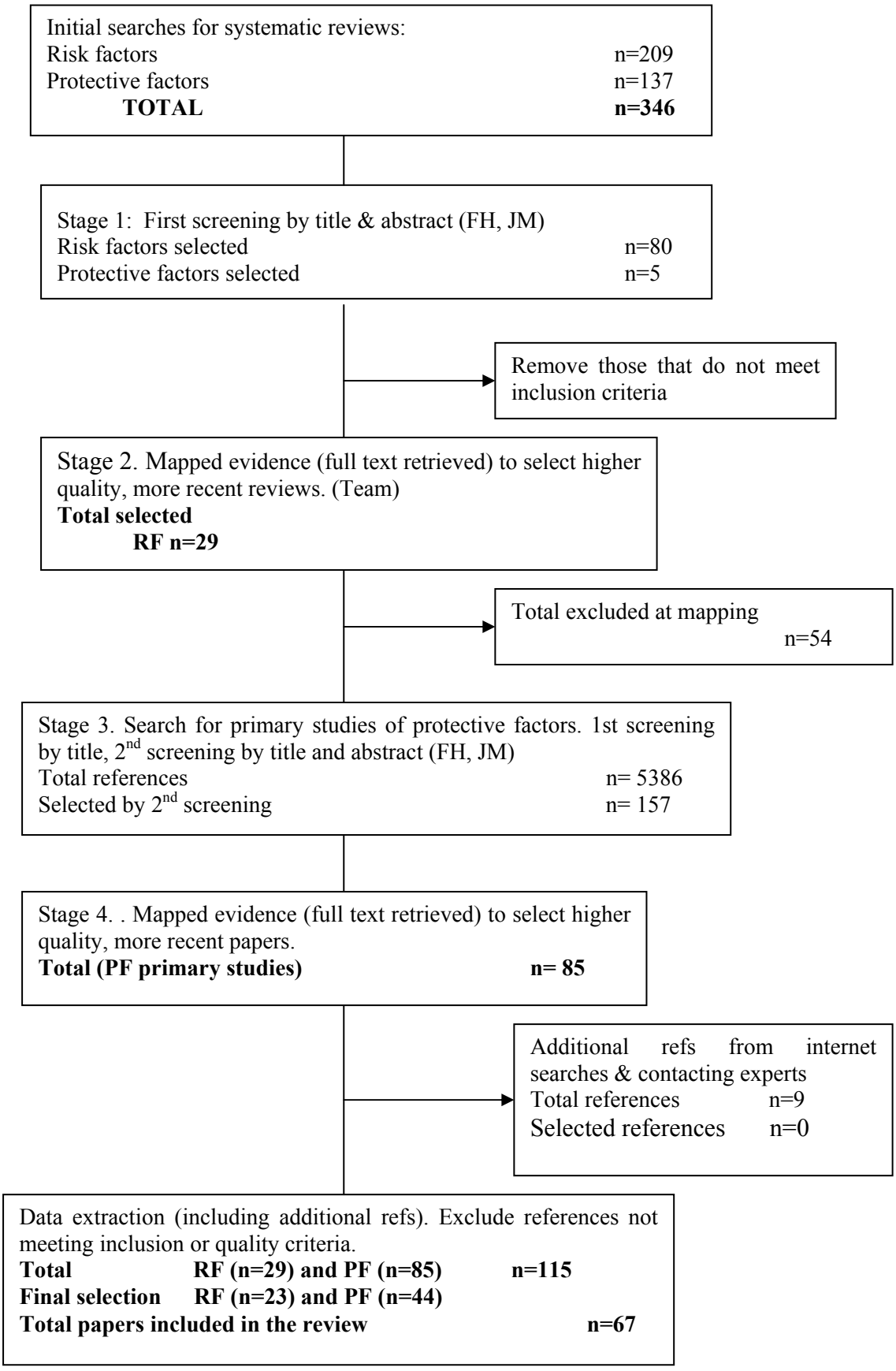
Suicidal ideation

Comprises thoughts about suicide, which may be as detailed as a formulated plan, without the suicidal act itself.

Systematic review (synonym: systematic overview)

A review of a clearly formulated question that uses systematic and explicit methods to identify, select and critically appraise relevant research, and to collect and analyse data from the studies that are included in the review. Statistical methods (meta-analysis) may or may not be used to analyse and summarise the results of the included studies.

ANNEX 1 QUORUM STATEMENT



ANNEX 2 SEARCH HISTORIES: RISK FACTORS

OVID Medline, Cinahl, Embase and IBSS Search Histories (22-1-07)

#	*Search History*
1	suicid$.ti,ab.
2	suicid$.mp. and self-harm.ti,ab. [mp=ti, hw, ab, it, sh, tn, ot, dm, mf, nm, gh]
3	1 or 2
4	(assisted adj suicide).ti,ab.
5	euthanasia.ti,ab.
6	4 or 5
7	3 not 6
8	(risk or (risk adj2 factor$) or (relative adj risk) or (attributable adj risk)).ti,ab.
9	meta?analy$.mp.
10	meta analy$.mp.
11	(systematic and review$).mp.
12	9 or 10 or 11
13	case report.ti.
14	editorial.pt.
15	letter.pt.
16	13 or 14 or 15
17	12 not 16
18	7 and 8
19	18 and 17
20	limit 19 to abstracts
21	limit 20 to english language [Limit not valid in: International Bibliography of the Social Sciences; records were retained]
22	limit 21 to yr="1996 - 2007"
23	remove duplicates from 22

CSA Databases: ASSIA, Sociological Abstracts & Social Services Abstracts (22-1-07)

(TI=(meta-analy* or (meta analy*) or (systematic review*)) or AB=(meta-analy* or (meta analy*) or (systematic review*))) and ((((TI=(suicid* or (suicid* and self-harm)) or AB=(suicid* or (suicid* and self-harm))) or (TI=(suicid* or (suicid* and self-harm)) or AB=(suicid* or (suicid* and self-harm)))) not (TI=((assisted suicid*) or euthanasia) and AB=((assisted suicid*) or euthanasia))) and (TI=(risk or (risk factor$) or (relative risk) or (attributable risk)) or AB=(risk or (risk factor$) or (relative risk) or (attributable risk))))

Date limited 1996-2007; English Language; Duplicates removed

ESRC Society Today

No relevant studies that were completed with available reports were identified. The database was searched using simple search terms for both risk and protective factors reviews and primary studies.

Ovid PsycINFO (via NHS e-library) 23-01-07

#	Search History
1	suicid$.ti,ab.
2	(suicid$ and self-harm).ti,ab.
3	1 or 2
4	((assisted adj suicide) or euthanasia).ti,ab.
5	3 not 4
6	(risk$ or (risk adj factor$) or (relative adj risk$) or (attributable adj risk$)).ti,ab.
7	5 and 6
8	meta?analy$.mp.
9	(systematic and review$).mp.
10	8 or 9
11	case report.ti.
12	editorial.pt.
13	letter.pt.
14	10 not 11
15	14 and 7
16	limit 15 to (english language and abstracts and yr="1996 - 2007")

National Research Register (23-01-07)

Simple searches were conducted that encompassed reviews and primary studies for risk and protective factors literature.

ANNEX 3 MAPPING TOOL FOR RISK FACTOR REVIEWS

Risk Factor*	Author	Year	Details	Participants (e.g. children, post-natal)	Action
Mental Health					
Non-fatal self-harm					
People affected by self-harm					
Substance misuse					
Prison					
Bereaved					
Unemploy-ment					
Work					
Professions					
Rural/isolated communities					
Urban deprivation					
Poverty					
Homelessness					
Chronic Illness					
HIV/Aids					
LGBT					
Isolation and loneliness					
Access to means					
Agression/ violence					
Individual factors such as: Low self esteem, hopelessness, anhedonia					
Non-help seeking					

*Risk factor categories for the mapping exercise vary according to the literature
**Individual, psychosocial, societal

ANNEX 4 SEARCH HISTORIES: SYSTEMATIC REVIEWS OF PROTECTIVE FACTORS

OVID Medline, Cinahl, Embase and IBSS Search Histories (24-1-07)

#	*Search History*
1	suicid$.ti,ab.
2	suicid$.mp. and self-harm.ti,ab. [mp=ti, hw, ab, it, sh, tn, ot, dm, mf, nm, gh]
3	1 or 2
4	(assisted adj suicide).ti,ab.
5	euthanasia.ti,ab.
6	4 or 5
7	3 not 6
8	(resilienc$ or recovery or protect$ or cop$).ti,ab.
9	meta?analy$.mp.
10	(systematic and review$).mp.
11	9 or 10
12	case report.ti.
13	editorial.pt.
14	letter.pt.
15	12 or 13 or 14
16	11 not 15
17	7 and 8 and 16
18	limit 17 to abstracts
19	limit 18 to english language [Limit not valid in: International Bibliography of the Social Sciences; records were retained]
20	limit 19 to yr="1996 - 2007"
21	remove duplicates from 20

CSA Databases: ASSIA, Sociological Abstracts & Social Services Abstracts (24-1-07)

((((TI=suicid* or AB=suicid*) or (TI=(suicid* and (self-harm)) or AB=(suicid* and (self-harm)))) not (TI=(euthanasia or (assisted suicide)) or AB=(euthanasia or (assisted suicide)))) and (TI=(resilien* or recovery or (protect* or cop*)) or AB=(resilien* or recovery or (protect* or cop*)))) and (meta?analy* or (systematic and review))

Date limited 1996-2007; English Language; Duplicates removed

Ovid PsycINFO (via NHS e-library)

#	***Search History***
1	suicid$.ti,ab.
2	(suicid$ and self-harm).ti,ab.
3	1 or 2
4	((assisted adj suicide) or euthanasia).ti,ab.
5	3 not 4
6	(resilien$ or recovery or protect$ or cop$).ti,ab.
7	5 and 6
8	meta?analy$.mp.
9	(systematic and review$).mp.
10	8 or 9
11	case report.ti.
12	editorial.pt.
13	letter.pt.
14	11 or 12 or 13
15	10 not 14
16	15 and 7
17	limit 16 to (english language and abstracts and yr="1996 - 2007")

ANNEX 5 SEARCH HISTORIES FOR PRIMARY STUDIES OF PROTECTIVE FACTORS

OVID Medline, Cinahl, Embase and IBSS Search Histories (3-4-2007)

#	Search History
1	suicid$.ti,ab,kw.
2	(suicid$ and self-harm).ti,ab,kw.
3	1 or 2
4	(assisted adj suicide).ti,ab,kw.
5	euthanasia.ti,ab,kw.
6	4 or 5
7	3 not 6
8	(resilien$ or recover$ or protect$ or cop$ or (coping adj skill$) or (improved adj outcome$) or (positive adj outcome$) or (coping adj strateg$) or (pattern$ adj2 coping) or (coping adj process$) or (risk adj modifier$) or (protective adj process$)).ti,ab,kw.
9	meta?analy$.ti,ab,kw.
10	((systematic adj1 review$) or (literature adj review)).ti,ab,kw.
11	9 or 10
12	case report.ti.
13	editorial.pt.
14	letter.pt.
15	12 or 13 or 14 or 11
16	7 and 8
17	16 not 15
18	17
19	limit 18 to english
20	limit 19 to english language [Limit not valid in: International Bibliography of the Social Sciences; records were retained]

CSA Databases: ASSIA, Sociological Abstracts & Social Services Abstracts (4-4-07)
((((TI=suicid* or AB=suicid*) or (TI=(suicid* and (self-harm)) or AB=(suicid* and (self-harm)))) not (TI=(euthanasia or (assisted suicide)) or AB=(euthanasia or (assisted suicide)))) and (TI=(resilien* or recovery or (protect* or cop*)) or AB=(resilien* or recovery or (protect* or cop*)))) not (meta?analy* or (systematic and review))

Date limited 1996-2007; English Language; Duplicates removed

Ovid PsycINFO via NHS e-library (3-4-2007)

#	Search History
1	suicid$.ti,ab.
2	(suicid$ and self-harm).ti,ab.
3	1 or 2
4	((assisted adj suicide) or euthanasia).ti,ab.
5	3 not 4
6	(resilien$ or recover$ or protect$ or cop$ or (coping adj skill$) or (improved adj outcome$) or (positive adj outcome$) or (coping adj strateg$) or (pattern$ adj2 coping) or (coping adj process$) or (risk adj modifier$) or (protective adj process$)).ti,ab.
7	5 and 6
8	meta?analy$.mp.
9	(systematic and review$).mp.
10	8 or 9
11	7 not 10
12	limit 11 to English
13	limit 12 to English language
14	limit 13 to yr="1996 - 2007"

ANNEX 6 EXPERT PANEL

The following named experts and the heads of organisations listed on the expert panel were consulted at Step 3 of the review of evidence on protective factors:

Research specialist	Jacki Gordon, Choose Life National Implementation Support Team
Research specialist	Alistair Leyland, MRC Social and Public Health Sciences Unit
Research specialist	Malcolm Hill, Director of the Glasgow Centre for Child and Society, Glasgow University
Research specialist	Rory O'Connor, Suicidal Behaviour Research Group, University of Stirling
Black, Minority and Ethnic Groups	Head of National Resource Centre for Ethnic Minority Health
Lesbian, Gay, Bisexual and Transgender	Head of LGBT Health
Royal College of Psychiatrists	Tom Brown to nominate
Psychology	Kate Davidson, NHS Glasgow
Nursing	Choose Life Clinical Network/Carol Watson, NES
Bereavement	Head of CRUSE
Samaritans	Francis Simpson
Social care	Christina Naismith, Joint Programme Manager Mental Health, City of Edinburgh Council/NHS Lothian
Scottish Executive policy makers	Gregor Henderson
Scottish Recovery Network	Simon Bradstreet
Voices of Experience	Theresa McGuire
Self-harm	Pat Little, Penumbra
Scottish Prison Service	Andrew Fraser/Vince Fletcher
Young People's Unit	Cathy Richards
Homelessness	Archie Stoddart, Director, Shelter Scotland,
Substance Misuse	Dougie Paterson, Choose Life National Implementation Support Team

Rural/isolation	Cameron Stark, NHS Highland
Poverty	Poverty Alliance, Scottish Poverty Information Unit, Glasgow Caledonian University
Work and employment	Sheila Durie
NHS Health Scotland	Emma Hogg/Mary Allison
Health Promoting School Unit	Jo Kopela
The Netherlands	*Ad Kerkhof*
New Zealand	*Annette Beautrais,*
Ireland	*Ella Arensman*
Austria	*Konrad Michel*
Australia	*Diego de Leo*
Denmark	*Merete Nordentoft*
USA	*Morton Silverman*
Norway	*Lars Mehlum*

ANNEX 7 MAPPING TOOL FOR PROTECTIVE FACTORS

Protective Factor*	Author	Year	Details	Level**	Participants (e.g. children, post-natal)	Action
Adaptable temperament						
Problem-solving skills						
Hopefulness						
Cognitive flexibility						
Coping skills						
Self help						
Self-esteem						
Relationships e.g. Marriage, stability						
Social support and social networks						
Positive school and work experiences						
Spiritual faith						
Neighbourhood quality						
Membership of clubs						
Quality of social services and health care						
Reducing availability of means						
Tackling stigma						
Crisis services						
Medication						

*Protective factor categories for the mapping exercise may vary according to the literature
**Individual, psychosocial, societal
***The categories in the mapping tool will not be used as actual search terms for primary literature but will act as a guide for searches

ANNEX 8: REFERENCES INCLUDED IN THE REVIEW

Included references for risk factors

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ANNEX 9 DATA EXTRACTION FIELDS

Data extraction database (list of fields) for risk and protective factor systematic reviews and primary studies

Database Field	***Description***
ID (First Author & Year)	
Risk/Protective	Select from either risk or protective factors
Title	Title of paper
Data extracted by ?	Select reviewer's initials
Date of extraction	
Relevance to topic?	After a quick reading is this relevant to the topic?
Continue?	Yes/No
Explain why/why not	Give reason for exclusion
Objectives	Give a short statement of the study/review objectives
Population - details	If possible give further information on setting & recruitment e.g. risk group
Lifepoint	Select from the following: Children = <16 yrs; young people = 16-24yrs; older adults <65
Combination study - details	Give brief details of the age groups included in the study
Gender	Select F/M
Dates of study	Dates e.g. June 2000 - January 2001
Funder	Who funded the study?
Completion rate	% participants who completed the study; were reasons for non-completion described?
Levels	Choose from individual, community or population level study
Method of recruitment	
Outcomes	Give full details of the outcomes (i.e. what is being measured)
Describe study	Choose one of the drop-down menu options for research method used or give details under 'Other' in the next column.
Other info - describe	Provide further brief details e.g. single/serial interviews
Inclusion/selection Criteria	Give short details of inclusion/selection criteria

Database Field	***Description***
Exclusion criteria	Give short details of exclusion criteria
Setting (country/region)	Give details where appropriate - country, region, urban/rural etc.
Setting (social)	School, workplace, community etc
No Participants	Give total number of participants; number of focus groups/interviews e.g. 31 participants in 6 focus groups/15 paired interviews and 1 single etc.
Socioeconomic data	
Conceptual/theoretical debates	Briefly describe how the paper engages with concepts/theoretical debates.
Analysis	Give details of how analysis was performed where available. (might include theoretical background e.g. interpretive approach/grounded theory etc)
Results	Give summary of the results/findings - pay particular attention to any contextual data on inequalities etc
Conclusions	May consist of some summary points.
Scotland relevance?	Give a score from A-D. A=includes UK studies; B=probably relevant; C=possibly relevant; D=not relevant.
Why results generalisable?	Give reason why
Adverse effect of research	Does the paper demonstrate any adverse effects associated with research participation? Give details
Discuss inequalities?	Yes/No
Recommendations for future research?	Give details, where appropriate, of any evidence gaps or recommendations for further research identified by authors
Economic impact data	Give details, if available, of data related to economic aspects
Policy & practice implications	Are there implications for policy or practice from this study? If so, describe.
Quality of the evidence	Give score ++/+/- (Base this on methodology checklist - see guidance)
Refer to other reviewer?	Yes/No
Reason referred	Give your reasons for seeking a second opinion
Further comments	Insert any further comments re quality/relevance/or thoughts generated by the discussion etc. If rejecting at this stage, give reasons but also reject at 'continue' stage above.

ANNEX 10 QUALITY ASSESSMENT TOOLS

Quality Assessment Tool for cross-sectional studies

Author: *Year:*	*Short title:*		
Checklist completed by:			
Descriptor	**YES/NO**	**N/A**	**COMMENT**
SECTION 1: ABSTRACT			
Design identified as Cross-sectional Study?			
SECTION 2: INTRODUCTION			
Population under study (controls and subjects) defined and issue(s) of interest clarified.			
Background and significance as to why study was conducted.			
Brief review of pertinent literature.			
SECTION 3: METHODS			
Define the source of information (survey, record review).			
List inclusion and exclusion criteria for exposed and unexposed subjects (cases and controls) or refer to previous publications			
Clarify sample size determination (e.g., statistically or participants accrued over a specified time period); if statistically predetermined, elaborate in statistical methods section.			
Ethics approval and informed consent obtained.			
Describe relevant primary and secondary measurements and the time point(s) used for data recording when relevant			
Indicate how assessments/measurements were made and describe evaluators.			
Clarify any assumptions used in calculating sample size.			
Explain any participant exclusions from analysis.			

Explain analytic method for all outcome analyses and identify specific software programs employed			
If applicable, note that statistical analyses take complex sampling designs into account.			
Describe how confounding was assessed and/or controlled.			
If applicable, explain how missing data were handled in the analysis.			
SECTION 4: RESULTS			
Describe demographic characteristics and all variables of prognostic importance.			
Summarize response rates and completeness of data collection. Clarify what follow-up, if any, was expected and the percentage of patients for which incomplete data or follow-up was obtained.			
Compare completeness of data within each subgroup for each candidate risk factor of interest.			
Describe extent to which sampled study population is representative of target population.			
Provide confidence intervals for prevalence estimates and *P* values for all major comparisons between subgroups.			
Report assessment of confounding among the known and candidate risk factors.			
SECTION 5: DISCUSSION			
Briefly summarize important study findings.			
Interpret the study findings.			
Discuss possible bias.			
Contrast or compare study results to other studies.			
Comment on generalizability of results and identify non-applicable participants.			
Summarize study design limitations and weaknesses.			

SECTION 6: OVERALL ASSESSMENT OF THE STUDY	
Risk of bias or confounding? (Study quality)	*Code ++, + or –*
Relevance to the UK?	YES NO UNSURE
COMMENTS:	

Quality Assessment Tool for case control studies

Study identification **Short Title:** **Author _____Year _____**		
Checklist completed by:		
SECTION 1: INTERNAL VALIDITY		
1.1 The study addresses an appropriate and clearly focused question.	Well covered Adequately addressed Poorly addressed	Not addressed Not reported Not applicable
SELECTION OF SUBJECTS		
1.2 The cases and controls are taken from comparable populations.	Well covered Adequately addressed Poorly addressed	Not addressed Not reported Not applicable
1.3 The same exclusion criteria are used for both cases and controls.	Well covered Adequately addressed Poorly addressed	Not addressed Not reported Not applicable
1.4 Were percentage of each group (cases and controls) reported in the study?	YES NO UNCLEAR	
1.5 Comparison is made between participants and non-participants to establish their similarities or differences.	Well covered Adequately addressed Poorly addressed	Not addressed Not reported Not applicable
1.6 Cases are clearly defined and differentiated from controls.	Well covered Adequately addressed Poorly addressed	Not addressed Not reported Not applicable
1.7 Is it clearly established that controls are non-cases?	Well covered Adequately addressed Poorly addressed	Not addressed Not reported Not applicable
ASSESSMENT		
1.8 Measures have been taken to prevent knowledge of primary exposure influencing case ascertainment.	Well covered Adequately addressed Poorly addressed	Not addressed Not reported Not applicable
1.9 Exposure status is measured in a standard, valid and reliable way.	Well covered Adequately addressed Poorly addressed	Not addressed Not reported Not applicable

Quality Assessment Tool for cohort studies

Study identification *Author:* *Year:*	*Short title:*	
Checklist completed by:		
SECTION 1:		
1. Are the objectives or hypotheses of the study clearly stated?	Yes	NO
2. Is the target population defined?	Yes	NO
3. Is the sampling frame defined? (Not always the same as target pop.)	Yes	NO
4. Is the study population defined?	Yes	NO
5. Are the study setting (venues) and/or geographic location stated?	Yes	NO
6. Are the dates between which the study was conducted stated?	Yes	NO
7. Are eligibility criteria stated?	Yes	NO
8. Are issues of 'selection in' to the study mentioned?	Yes	NO
9. Is the numbers of participants justified?	Yes Unsure	NO
10. Are the numbers meeting and not meeting the eligibility criteria stated?	Yes Unsure	NO
11. For those not eligible, are the reasons why stated?	Yes	NO
12. Are the numbers of people who did/did not consent to participate stated?	Yes	NO
13. Are the reasons that people refused to consent stated?	Yes	NO
14. Were consenters compared with non-consenters?	Yes Not stated	NO

15. Was the number of participants at the beginning of the study stated?	Yes	NO
16. Were the methods of data collection stated?	Yes	NO
17. Was the reliability (repeatability) of measurement methods mentioned?	Yes	NO
18. Was the validity (against a "goldstandard") of measurement methodsmentioned?	Yes	NO
19. Were any confounders mentioned?	Yes	NO
20. Was the number of participants at each stage/wave specified?	Yes	NO
21. Were reasons for loss to follow-up quantified?	Yes Not stated	NO
22. Was the absence of data items at each wave mentioned?	Yes	NO
23. Was the type of analyses conducted stated?	Yes	NO
24. Were "longitudinal" analysis methods stated?	Yes	NO
25. Were absolute effect sizes reported?	Yes	NO
26. Were relative effect sizes reported?	Yes	NO
27. Was loss to follow-up taken into account in the analysis?	Yes	NO
28. Were confounders accounted for in analyses?	Yes Not stated	NO
29. Were missing data accounted for in theanalyses?	Yes Not stated	NO
30. Was the impact of biases assessed qualitatively?	Yes Not stated	NO
31. Was the impact of biases estimated quantitatively?	Yes Not stated	NO
32. Did authors relate results back to a target population?	Yes Not stated	NO
33. Was there any other discussion of generalisability?	Yes	NO

SECTION 2: OVERALL ASSESSMENT OF THE STUDY	
How well was the study done to minimise bias? (Study quality)	*Code ++, + or –*
Relevance to the UK?	YES NO UNSURE
Comments	

Quality Assessment Tool for qualitative studies

Study identification *Author:* *Year:*	*Short title:*	
Checklist completed by:		
SECTION 1: Epistemology		
1. 1. Is a qualitative approach appropriate?	Yes No Unsure	Comments:
1.2. Is the study clearly focussed?	Yes No Unsure	Comments:
1.3. Has the study drawn on the relevant literature?	Yes No Unsure	Comments:
1.4. Does the study discuss underpinning values/assumptions/theory?	Yes No Unsure	Comments:
SECTION 2: Study Design		
2.1. Is the research design appropriate to the question?	Yes No Unsure	Comments:
2.2. Are there clear accounts of the criteria used for sampling, data collection, data analysis?	Yes No	Comments:

	Unsure	
Section 3: Data Collection		
3.1 Was the method of data collection appropriate to the question?	Yes No Unsure	Comments:
Section 4: Validity		
4.1. Has the relationship between the researcher and the participants been adequately considered?	Yes No Not stated	Comments:
4.2. Is the context clearly described? E.g. socio-economic/cultural characteristics; settings?	Yes No Unsure	Comments:
Section 5: Analysis		
5.1. Does the analysis show attention to a variety of perspectives and possible interpretations?	Yes No Unsure	Comments:
5.2. Have comparisons been drawn across groups/sites?	Yes No Unsure	Comments:
5.3. Does the analysis display sufficient depth?	Yes No Unsure	Comments:
5.4. Are the conclusions supported by the data and analysis?	Yes No	Comments:

	Unsure	
Section 6: Ethics		
6.1. Have ethical issues been taken into consideration? (e.g. consent, anonymity, confidentiality?)	Yes No Unsure Not stated	Comments:
6.2. Was the study approved by an ethics committee?	Yes No Not stated	Comments:
Overall Assessment		
Relevant to UK?	Yes No Unsure	Overall Comments:

Quality Assessment Tool for systematic reviews

The table below illustrates the checklist of criteria used to determine quality and risk of bias in systematic reviews. This was incorporated within the data extraction database, by having a separate table for systematic reviews.

CRITERIA	YES	NO	NOT STATED
1. Was there a focused aim or research question?			
2. Explicit inclusion/exclusion criteria			
3. More than 1 assessor/selector			
4. Provided details of databases searched			
5. Lists years searched			
6. Followed up references in bibliographies			
7. Experts consulted for further sources			
8. Grey literature included/searched			
9. Specified search terms/strategy			
10. Not restricted to English language papers only			
11. Used quality assessment			
12. Data supports conclusions			

ANNEX 11 EVIDENCE TABLES

The evidence tables below were generated from the included papers. Only results and outcomes relevant to this review are reported in the main findings, rather than the full results of each study. For instance, in those studies that reported results for suicide ideation, attempt and completion, only suicide attempt and completion were reported below. Where possible/necessary, authors' abstracts were annotated as required with additional data from results sections of papers. In some systematic reviews, Odds Ratios are not provided because the number of included studies were too great and overall figures had not been presented (generally owing to the heterogeneity of included studies). Furthermore, in some of the primary studies, ORs may have been provided with p values but no confidence intervals were provided in the source document.

Relevance to the UK is assessed as indicated earlier at Table 2.1 i.e.:

Score (A-D)	Description
A (directly relevant)	Includes UK studies
B (probably relevant)	Includes non-UK studies but the context/population group would apply equally to UK settings
C (possibly relevant)	Includes non-UK studies that may have some application to UK settings but should be interpreted with caution. There may be strong cultural or institutional differences that would have limited applicability in the UK
D (not relevant)	Includes non-UK studies that are clearly irrelevant to UK settings

Evidence tables for systematic reviews of risk factors

First author & date	Population, No. of studies & No. of participants	Objectives	Main results	Location & applicability to UK[5]
Arsenault-Lapierre 2004	Suicide completers 27 studies 3275 participants	To conduct quantitative syntheses of overall and specific psychiatric diagnoses found in suicide studies and to explore possible gender and geographical differences in the distribution of psychiatric disorders among suicide completers.	Twenty-seven studies comprising 3275 suicides were included, of which, 87.3% (SD 10.0%) had been diagnosed with a mental disorder prior to their death. There were major gender differences. Diagnoses of substance-related problems (OR = 3.58; 95% CI: 2.78–4.61), personality disorders (OR = 2.01; 95% CI: 1.38–2.95) and childhood disorders (OR = 4.95; 95% CI: 2.69–9.31) were more common among male suicides, whereas affective disorders (OR = 0.66; 95% CI: 0.53–0.83), including depressive disorders (OR = 0.53; 95% CI: 0.42–0.68) were less common among males. However, the gender differences were not completely clear-cut, as the female sample was older than the male one where therer were significant differences. Geographical differences are also likely to be present in the relative proportion of psychiatric diagnoses among suicides, although again this included a range of age groups. Psychiatric diagnoses was present in the majority of cases in all regions, ranging from 89.7 % (SD 4.2 %) of the American suicides had at least one diagnosis, whereas 88.8 % (SD 8.9 %) of the European suicides, 83.0 % (SD 18.4 %) of the Asian suicides and 78.9 % (SD 15.3 %) of the Australian suicides had at least one psychiatric diagnosis.	Europe (including 1 from Israel), North America, Australia, Asia A
Bostwick 2000	Outpatients, inpatients and suicidal inpatients with affective disorders 41 studies (included in meta-analysis)	To provide an alternative estimate of suicide risk than that produced by the 1970 study by Guze and Robins, and question the generalisability of the earlier estimate.	Fifty-nine studies were included in the review. The review authors found that there was a hierarchy in suicide risk among patients with affective disorders. The estimate of the lifetime prevalence of suicide in those ever hospitalized for suicidality was 8.6%. For affective disorder patients hospitalized without specification of suicidality, the lifetime risk of suicide was 4.0%. The lifetime suicide prevalence for mixed inpatient/outpatient populations was 2.2%, and for the nonaffectively ill population, it was less than 0.5%. The case fatality prevalence of affective disorder inpatients significantly differed from that of both suicidal inpatients ($\chi2$=5.40, df=1, p=0.02) and affective disorder outpatients ($\chi2$=12.87,	Not stated C

[5] As detailed in table 2.1 (main body of text), all reviews were graded as A, B, C or D based on the types of studies that the reviews contained, and their applicability to the UK context. A= contains UK studies and are applicable; B= included non-UK studies, but might have applicability to UK context; C= includes non-UK studies that may not have applicability to UK context; D includes non-UK studies that are clearly irrelevant to the UK context

First author & date	Population, No. of studies & No. of participants	Objectives	Main results	Location & applicability to UK[5]
	31159 (not clearly reported)		df=1, p=0.0003). Also, the case fatality prevalence of the affective disorder outpatients and the suicidal inpatients significantly differed (χ2=43.84, df=1, p<0.0001).	
Brezo 2006	Suicide completers, attempters and ideators 90 studies over 20,000 participants	To review conceptual background and empirical evidence investigating roles of personality traits in suicidal behaviours.	Ninety studies were included in the review. Most studies focused on investigating risk for suicide attempts. The authors reported that hopelessness, neuroticism, and extroversion hold the most promise in relation to risk screening across all three suicidal behaviours. The authors concluded that more research is needed regarding aggression, impulsivity, anger, irritability, hostility, and anxiety. No overall ORs were presented for this study, therefore only the overall conclusions are presented here since the large number of studies with separate results could not be reported here.	Not stated C
Cherpitel 2004	Adults over 19 yrs of age; suicide attempters or completers 53 studies Over 10,000 participants	To assess what is known about the association between acute alcohol use and suicidal behavior; explore methodological challenges and suggest areas for future research	Fifty three studies were included in the review. The majority of studies reviewed were restricted to descriptive studies that documented the prevalence of suicide completers or attempters who tested positive for alcohol use. A wide range of alcohol-positive cases were found for both completed suicide (10–69%) and suicide attempts (10–73%). Common methodologic limitations of the included studies included the lack of control groups (for evaluating risk conferred by alcohol use), selection and ascertainment bias, and small sample sizes. The results of the case-crossover pilot study indicated substantially higher risk of suicide during or shortly after use of alcohol compared with alcohol-free periods. The authors note the problems of the wide range in results for alcohol use (eg 10-69%) and state that among the limitations were the fact that some studies included self-harm and parasuicide within results for suicide attempts. Also, the primary focus of the studies was not necessarily alcohol use and suicide; the methods of measuring alcohol use ranged from self report to blood alcohol concentrations, making it difficult to compare across studies. In some studies, screening for alcohol use was also variable - with as much as 60% of those dying by suicide not screened. Reasons included the fact that bodies were charred or mutilated or people were in hospital for 48 hours. This was also the case with suicide attempters - not all were	Scotland, England, Northern Ireland, other European continent, North & South America, Australia, South Africa, Tanzania, India A

First author & date	Population, No. of studies & No. of participants	Objectives	Main results	Location & applicability to UK[5]
			screened for a range of reasons.	
Fleischmann 2005	Young people with mental disorders; suicide completers 13 studies 894 participants	To explore the presence and distribution of mental disorders in cases of completed suicide among young people worldwide. their comparative importance for understanding suicide and its prevention in young people.	Thirteen studies were included in the review. The majority of cases (88.6%) had a diagnosis of at least 1 mental disorder. Mood disorders were most frequent (42.1%), followed by substance-related disorders (40.8%) and disruptive behavior disorders (20.8%). Of the 236 diagnoses that included information regarding the subcategories, 56.4% were major depressive disorder, 22.0% were mood disorders not otherwise specified, and 16.5% were dysthymia. Substance-related disorders were divided between drug use disorders/drug abuse and alcohol dependence/ alcohol abuse. Of the 339 diagnoses, 53.7% were alcohol dependence/abuse, and 46.3% accounted for drug use disorders/drug abuse. The broad category "disruptive behavior disorders" included conduct disorder, attention-deficit disorder, oppositional disorder, and identity disorder. Information on the subcategories was available for 156 diagnoses, of which 66.0% were attributed to conduct disorder, 16.0% fell under attention deficit disorder, and 13.5% were disruptive behavior disorders (without further specification). Only four of the studies used a case control design and provided ORs. The authors conclude that suicide prevention strategies should take into account contextual factors and be targetted at mental disorders as a whole and not focus on depression alone.	UK, Israel, Sweden, Norway, Finland, Australia, USA A
Hawton 2005a	Schizophrenic patients over 16 years of age 29 studies Over 10,000 participants	To identify risk factors for suicide in schizophrenia.	Twenty-nine eligible studies were synthesised in this paper - although this was from a total of 37 papers included in this review. Factors with robust evidence of increased risk of suicide were: previous depressive disorders (OR=3.03, 95% CI 2.06 - 4.46), previous suicide attempts (OR=4.09, 95% CI 2.79 - 6.01), drug misuse (OR=3.21, 95% CI 1.99 - 5.17), agitation or motor restlessness (OR=2.61, 95% CI 1.54 - 4.41), fear of mental disintegration (OR=12.1, 95% CI 1.89 - 81.3), poor adherence to treatment (OR=3.75, 95% CI 2.20 - 6.37) and recent loss (OR=4.03, 95% CI 1.37 -11.8). Reduced risk was associated with hallucinations (OR=0.50, 95% CI 0.35 - 0.71). The review demonstrated that rather than simply schizophrenia alone, other factors (above) increased risk of suicide.	Wide range of countries from Europe (including UK), North America, Asia and Australia A
Hawton 2005b	Risk group is persons with bipolar disorder	To discover the main risk factors for suicide and nonfatal suicide behaviour in patients with	Thirty seven studies were included in the review. Where more than one study reported the variables, they were pooled and reported as odds ratios in accompanying tables. The main risk factors for suicide were reported to be a	Majority of studies from Europe

First author & date	Population, No. of studies & No. of participants	Objectives	Main results	Location & applicability to UK[5]
	36 studies Reported study participants ranged from only 3 suicides matched with 136 controls to a very large study of 672 suicides and 14714 controls.	bipolar disorder	previous suicide attempt (OR=2.25, 95% CI = 1.02-4.96) and hopelessness (OR=0.51, 95% CI = 0.12-2.19). The main risk factors for nonfatal suicidal behavior included family history of suicide (OR=2.56, CI = 0.80-8.41), early onset of bipolar disorder (weighted mean difference = -2.97 yrs, 95% CI = -4.54 to -1.40; heterogeneity x2=6.39, p=0172), extent of depressive symptoms (one large study 137/219 cases compared with 230/429 controls), increasing severity of affective episodes, the presence of mixed affective states, rapid cycling, comorbid Axis I disorders, and abuse of alcohol (2 studies; OR=1.34,95% CI = 0.46-3.93) or drugs (2 studies; OR=0.51, 95% CI = 0.12-2.19). Suicide risk was found to be elevated in the male gender (OR=1.46 95% CI=1.25-1.70) but there was no association with ethnicity, marital or employment status. Conversely, there was no gender difference in suicide attempts. As the authors acknolwedge, methodological limitations of the included studies mean that these results should be interpreted with caution.	(including UK) and North America, Taiwan and Turkey A
Hem 2001	Members of the police force 20 studies Over 1100 participants	To explore the level and variation of suicide risk among police officers compared to the general population and other groups	Twenty studies were included in the review. None of the nationwide studies showed elevated suicide rates among police. The largest (nationwide) study was conducted in France, with a total of 749 police suicides. Adjusting for age and gender, the suicide rate in police was 34.8 per 100,000 per year compared to 35.4 per 100,000 per year in the general population. Another nationwide study in Germany also demonstrated no higher risk of suicide among the police force. In a population based study in England and Wales (covering 1982-96), police had the lowest occupational suicidal mortality ratio, although the proportional mortality ratio increased from 61-79 in the later period included in the study, the authors state that the 95% CIs overlapped so that conclusions couldn't be made regarding trends. Other studies showed inconsistent results. One study found that many countries do not keep records of suicides in the police force and few countries have gathered statistics on suicides.	North America, Europe (including UK studies) and Australia A
James 2004	Persons with ADHD	To review the evidence of a possible association between attention deficit hyperactivity	The number of studies included in the review was not stated. An association of ADHD and completed suicide was found, especially for younger males. However, the evidence for any direct or independent link was modest with an overall suicide	Europe (including UK studies),

First author & date	Population, No. of studies & No. of participants	Objectives	Main results	Location & applicability to UK[5]
	Study & participant nos not stated	disorder (ADHD) and suicide.	rate from longterm follow-up studies of ADHD of 0.63–0.78%. The estimated relative risk ratio, compared with US national suicide rates (males 5–24 years) is 2.91 (95% confidence interval 1.47–5.7, x2 = 9.3, d.f. = 1, P = 0.002). ADHD appears to increase the risk of suicide in males via increasing severity of comorbid conditions, particularly conduct disorder (CD) and depression.	USA A
Lalovic 2002	Groups included: violent offenders & arsonists, hospital inpatients, schizophenics, depressed, bipolar, etc 17 studies participant numbers ranged from 27 suicide attempters and 190 controls to 231 suicide attempters and 282 controls	To explore the association between suicidal behavior and a biallelic intron 7 polymorphism in the tryptophan hydroxylase (TPH) gene	A total of 39 publications were identified and reviewed, and 17 studies were selected for inclusion in this study. The authors conducted two meta-analyses. One compared suicide attempters or completers (N=1,290) with healthy controls (N=2,295); the other compared suicide attempters (N=625) with nonattempters (N=1,475). None of these studies provided evidence for association (OR=1.14, 95% CI = 0.97–1.34 for the former and OR=0.96, 95% CI = 0.77–1.20 for the latter).	Europe, North America and Asia A
Li 2006	Schizophrenics, suicide attempters 61 papers (73 studies) Almost 20,000 participants	To re-examine the data on 5-HT2A with schizophrenia and suicidal behavior to discover whether there was statistical significance.	Compared with significant results reported previously, the current large samples (73 studies in all) failed to find significant association of the T102C polymorphism with either schizophrenia or suicidal behavior. Evidence of significant association was only detected between A-1438G and suicidal behavior (OR = 0.67 95% CI = 0.5 - 0.89) without evidence of heterogeneity.	Not clearly stated but tables show 'European and Asian' data. A
Lindeman	Doctors; suicide	To describe the variation of	Fourteen studies were included in the review. The estimated relative risk varied	Europe

First author & date	Population, No. of studies & No. of participants	Objectives	Main results	Location & applicability to UK[5]
1996	completers/rates 14 studies almost 1,000 participants	published estimates of relative risk of doctors to die by suicide.	from 1.1 to 3.4 in male doctors, and from 2.5 to 5.7 in female doctors, respectively, as compared with the general population, and from 1.5 to 3.8 in males and from 3.7 to 4.5 in females, respectively, as compared with other professionals. The crude suicide mortality rate was about the same in male and female doctors.	(including UK studies), North America and South Africa A
Neeleman 2001	Range of population groups 146 studies 1,179,126 participants	To explore whether suicide shares determinants with accidental and natural death	This meta-analytic study, which draws on findings from 146 publications covering mortality in 163 cohorts, explored cause-specific mortality associated with 16 known risk factors for suicide. It was hypothesised that (a) suicide risk factors should increase other mortality and (b) given exposure, excess risk should be higher for suicide than for other causes of mortality. Combining all risk groups, SMRs were highest for suicide (8.6 [95% CI : 7.1-10.4]); SMRs were also raised for accidental (3.4 [95% CI : 2.9-4.0]) and natural deaths (2.1 [95% CI : 1.9-2.3]). Compatible with the first hypothesis, in most groups, mortality of any type was raised. Supporting the second hypothesis, SMRs increased from lowest for natural death to highest for suicide. This trend was most pronounced for those belonging to the deliberate self-harm risk group (24.7 [16.3-37.6]), intermediate in substance abusers (alcohol misuse: 8.5 [5.9-12.1]; drug misuse: 10.1 [6.7-15.3]); and weakest, but present, among the bereaved (2.4 [2.0-2.8]) and low social class/umemployed (2.2 [1.6-3.0]) cohorts. The trend was reversed in smokers and persons with epilepsy, whose cause of death was more likely to be natural causes than death by suicide or accidental death.	Scandinavia, Western and Southern Europe, North America, Australia, New Zealand. B
Palmer 2005	Schizophrenics; completed suicides 61 studies 48,176 participants	To build a methodology for extrapolating lifetime suicide prevalence estimates from published cohorts and to apply this approach to studies that meet inclusion criteria.	Sixty one studies were included in the review. Studies were divided into 2 groups: 32 studies of schizophrenics enrolled at various illness points (25578 subjects) and 29 studies of schizophrenics identified at either illness onset or first admission (22598 subjects). Regression models of the intersection of proportionate mortality (the percentage of the dead who died by suicide) and case fatality (the percentage of the total sample who died by suicide) were used to calculate suicide risk in each group. The estimate of lifetime suicide prevalence in those observed from first admission or illness onset was 5.6% (95% confidence interval, 3.7%-8.5%). Mixed	Europe (including UK studies), North America, Asia A

First author & date	Population, No. of studies & No. of participants	Objectives	Main results	Location & applicability to UK[5]
			samples showed a rate of 1.8% (95% confidence interval, 1.4%-2.3%). Case fatality rates showed no significant differences when studies of patients diagnosed with the use of newer systems were compared with studies of patients diagnosed under older criteria.	
Platt 2000	Unemployed; and general population; completed suicide, DSH 165 studies No. Participants not stated	To explore the relationship between conditions of the labour market and suicidal behaviour.	One hundred and sixty five studies were included in the review. The authors found an increased risk of suicide and deliberate self-harm (DSH) among the unemployed although this varied according to study design. Individual cross-sectional studies showed an increased rate for both suicide and DSH, while individual longitudinal studies showed a double or triple rate of suicide, but inconsistent evidence for DSH. Aggregated cross-sectional and aggregated longitudinal showed either no evidence or heterogeneous results for this association. They also state that evidence from UK studies shows an association between unemployment, suicide and DSH in the 1970's but either a negative or non-significant association in the 1980's. The authors reported that there was no strong evidence to suggest female labour force participation rates have led to increased suicide rates. However, there was data to demonstrate that a positive impact of female labour participation rates was equivocal. Once again, there were inconsistent results both within and between groups of studies of different research designs. Social class and suicide (and DSH) are linked: the lower the social class, the higher the risk. However, the authors state that the highest proportional mortality rates for suicide are found in classes I and II. They suggest that this may be because there is a lower mortality rate for other causes in this group. There is evidence to support the higher risk of this group: e.g. one study of medical professions found estimated RRs of 1.1-3.4 for male doctors, 2.5-5.7 for female doctors compared to the general population; and compared to other professionals the RRs were 1.5-3.8 for men and 3.7-4.5 for women. Some of the inconsistent results could be due to the lack of methodological rigour in some of the studies, as the authors note.	Europe (including Scotland & other UK studies); New Zealand, Australia, North America, Japan and Taiwan A

First author & date	Population, No. of studies & No. of participants	Objectives	Main results	Location & applicability to UK[5]
Pompili 2005	Persons with borderline personality disorder; included suicide completers with this diagnosis 8 studies 1179 participants	To determine the suicide rate related to borderline personality disorder	Eight studies comprising 1179 persons with a diagnosis of borderline personality disorder were included in the review. 94 of them committed suicide. Results obtained for each study were processed together to calculate the mean figure for each year of suicides for 100,000 individuals suffering from borderline personality disorder. The meta-analysis showed that suicide among patients with borderline personality disorder is more frequent when compared with the general population - although the results vary across cohorts. All study analyses reported that patients with borderline personality disorder committed suicide more often as compared to the general population. Analysis across these studies also reveals that there is a higher rate of suicide with shorter followup time.	USA, Canada, Norway and Switzerland C
Pompili 2005	Persons with epilepsy compared wth the general population; suicide completers 29 studies 50,814 participants	To compare data reported in representative studies of suicide in epilepsy with data for the general population.	29 studies were selected, including an overall total of 50,814 patients, 187 of whom committed suicide. Results obtained for each study were processed together to calculate the mean number of suicides per 100,000 individuals suffering from epilepsy for each year. Study results were compared with statistics from the World Health Organisation for each country where studies were located in order to determine the suicide rates of the general population. The meta-analysis demonstrated that suicide in patients with epilepsy is more frequent than in the general population. However, a number of cohorts of epileptic patients had a suicide rate lower than that of the general population. There were also large discrepancies between studies. For instance, suicides in surgically treated patients had widely disparate figures - in a UK study (33-44yr old cohort) this amounted to 833 per 100,000; a Polish study (all ages) found 412 per 100,000 and an Australian study (all ages) found a rate of 227 per 100,000. Calculations were made based on cohort size, number of suicides and length of followup - all of which varied across studies. Risk factors identified within the included studies showed that temporal lobe epilepsy and those with temporal lobectomies and surgical resections had an increased risk of suicide. One study found increases in depression after surgery. Another study found a greater risk of suicide after the suppression of seizures or full	Europe (includes UK studies), Norway, Iceland, USA A

First author & date	Population, No. of studies & No. of participants	Objectives	Main results	Location & applicability to UK[5]
			control of seizures.	
Pompili 2006	Persons with eating disorders, obesity and concerns about weight; suicide completers, attempters and ideators Study and participant nos not stated	To review suicidality in patients with eating disorders, obesity and weight concern.	Number of studies included in the review were not stated. Using a narrative synthesis, this review found that individuals suffering from anorexia nervosa and bulimia nervosa commit suicide more often than their counterparts in the general population; also a few studies have suggested that suicide is the major cause of death among patients with anorexia nervosa, refuting the assumption that inanition (ie death from exhaustion and lack of food) generally threatens the life of these patients. Data concerning suicide in bulimia nervosa, on the other hand, are still scarce but suicide attempts are easily found among cohorts of patients with bulimia nervosa, which constitutes a risk factor for completed suicide. Suicidality in obesity and individuals with disturbed weight status has been reported. Differences between studies reveal that there are ranges of severity and types of eating disorders that impact on suicide risk. Threeof the included studies reported higher numbers of suicide attempts and DSH among bulimic patients where they exhibited purging behaviour. Comorbities and other factors were also implicated in suicide risk. For instance, one study of suicide in bulimia found that 20% of those who had attempted suicide had a major depressive disorder, and 11% were drug and alcohol misusers (citing Viesselman & Roig 1985). There were similar results for anorexia nervosa, with higher suicide attempts among the binge/purge sub-type; and also comorbid mental illnesses and/or drug or alcohol misuse. No suicidal behaviour data was provided for obesity and weight concern.	UK, Denmark, USA, Germany, Italy and Canada A
Rehkopf 2006	General population (to determine link between SES and suicide completion); 86 studies	To summarize current data on the variation of suicide rates across local areas with implications for suicide prevention and future research.	Eighty six studies were included in the review. Analyses at the community level were significantly more likely to demonstrate lower rates of suicide among higher socio-economic areas than studies using larger areas of aggregation. 70% of the significant results showed an inverse relationship between higher socio-economic status and suicide (i.e higher SES = lower suicide rates). Areal units ranged from neighbourhoods to countries, and the proportion of inverse associations increased with the smaller area of aggregation (test of trend $p<0.01$). Neighbourhood level aggregates produced an inverse relationship in 95% of the studies.	North America, Europe, Australia, New Zealand, Asia

First author & date	Population, No. of studies & No. of participants	Objectives	Main results	Location & applicability to UK[5]
	Participant nos not stated		Study results varied according to the measure of SES used ($p<0.01$). Measures of area poverty and deprivation (using indexes such as Townsend/Carstairs) are, at 95% of studies, most likely to be inversely associated with suicide rates (such that areas of higher socio-economic position were associated with lower suicide rates) and median income is least likely (at 50% of studies) to be inversely associated with suicide rates. Studies using measures of unemployment, education or occupation to determine SES were equally likely to demonstrate inverse associations (such that lower unemplyment, higher levels of educational attianment and higher status were assocaited with lower suicide rates) - 73% of studies achieved these results using these measures. The time period covered by studies also showed a trend towards an increase in the inverse association (IA) with more recent studies. For instance, the period 1941-1960 showed 0% inverse relation, 1961-1980 had 57% IA, and this percentage increased to 76% for the period 1981-2004. Study results did not vary significantly by gender or by study design.	A
Saunders 2006	Women (menstrual cyle and suicide risk); suicide attempt, ideation and completed suicide 44 studies sample sizes ranging from 13-3110 participants	To investigate the available data regarding possible associations between phases of the menstrual cycle and suicidal behaviour.	Forty four studies were included in the review. 13 studies focused on completed suicide, two addressed both attempted and completed suicide, 23 explored suicide attempts, 3 explored suicide attempts related to premenstrual syndrome (PMS), 3 to suicidal ideation and 2 to DSH. A variety of methodologies were used in these studies and there were notable differences in the conclusions reached. For instance, there was insufficient evidence for the association between completed suicide during the menstruation as the percentage of women in the menstruating phase ranged from 15-100%. The authors suggest that studies with better methodology indicate a positive relationship between aspects of the menstrual cycle and attempted suicide, and that there is limited evidence that the first week of the menstrual cycle is more commonly associated with attempts. However, the results differ widely between studies. Such behaviour appears to be more common in those phases of the menstrual cycle when oestrogen levels are lowest (the late luteal and follicular phases), and in those suffering from PMS.	not stated B

First author & date	Population, No. of studies & No. of participants	Objectives	Main results	Location & applicability to UK[5]
			The authors suggest methodological limitations to the included studies that may account for the heterogeneity of results.	
Shadigian 2005	Pregnant women; suicide completion 28 studies 349 completed suicides	To understand the causes of pregnancy-associated death in maternal homicide and suicides.	Twenty eight studies were included in the review, of which 21 reported on pregnancy-associated suicide. Comparison is difficult because of the variation in inclusion criteria between studies, with one study only exploring suicide during pregnancy and others including the post-partum period from 42 days to 8 years (with 1 year postpartum being the most common). The authors state that despite the variation in study types, all studies show that although suicide is less prevalent than death by homicide, it still remains a significant proportion of pregnancy associated death. The two included case control studies revealed a 3-6 times higher rate of suicide in women who had an abortion compared with pregnancies carried full term. However, the authors advise that careful analysis and replication of these findings is required and any confounding factors such as abuse rates or mental illness should be examined.	USA, Mozambique, Finland, Zimbabwe, India, Bangladesh, Sweden, Australia C
Speckens 2005	General population compared with high risk groups (young offenders and psychiatric patients); suicide attempters 22 studies Over 750 participants	To explore the potential relationship between deficiencies in social problem-solving skills and suicidal behavior in young people	Twenty two studies were included in the review. Most of these studies (which compared adolescent patients with suicide attempts versus either non-suicidal psychiatric or controls without a diagnosis of psychiatric disorder) found evidence for problem-solving deficits in the attempters; however, few of the differences remain after controlling for depression and/or hopelessness. CROSS-SECTIONAL STUDIES In what the authors describe as the 'general population', there were two studies of university students and one with navy trainees. All three studies found difference in coping skills between suicide attempters and non-attempters. Only one controlled for depression and hopelessness. Psychiatric in-patients were compared with out-patients (suicide attempters and non-attempters) in four studies. Two of the four studies found differences in problem-solving skills with suicide attempters having less problem-solving skills. One study found differences in problem-solving skills	USA, Canada, Norway, UK A

First author & date	Population, No. of studies & No. of participants	Objectives	Main results	Location & applicability to UK[5]
			in children with suicidal ideation but no difference between attempters and non-attempters. Another study found lower problem-solving skills in multiple attempters compared to those with only one attempt. In three studies of young people in detention centres, problem-solving skills were lower for suicide attempters than non-attempters. One of the studies highlighted the importance of taking the time scale into account, showing that those with current suicidal attempts/ideation (in the past 72 hrs) were more likely to have impaired problem-solving skills than other suicide attempters/non-attempters. CASE-CONTROL STUDIES Most studies found differences in problem-solving between attempters and non-attempters. However, the differences were greater between attempters and control groups without a diagnosis of psychiatric disorder rather than control groups who were psychiatric patients. LONGITUDINAL STUDIES The three longitudinal studies did not find a significant difference between attempters and non-attempters for problem-solving skills after controlling for depression or hopelessness.	
Wilcox 2004	Alcohol and drugs misusers; suicide completion 42 studies Total participant nos not reported	To update and expand on Harris and Barraclough's review [Harris, E.C., Barraclough, B., 1997. Suicide as an outcome for mental disorders. A meta-analysis, Br. J. Psychiatry 170, 205–228] of retrospective and prospective cohort studies of alcohol and drug use disorders and suicide.	The estimated standardized mortality ratios (SMR; 95% confidence interval) for suicide were as follows: alcohol use disorder (979; 95% CI 898–1065; $p < 0.001$), opioid use disorder (1351; 95% CI 1047–1715; $p < 0.001$), intravenous drug use (1373; 95% CI 1029–1796; $p < 0.001$), mixed drug use (1685; 95% CI 1473–1920; $p < 0.001$), heavy drinking (351; 95% CI 251–478; $p < 0.001$). The authors state that there was much between study heterogeneity for alcohol, intravenous drug use and mixed drug use which they thought might be due to variations in study samples, methods or other factors.	UK (including Scotland), USA, Sweden, Norway, Spain, Netherlands, Italy, Canada, Kuwait

First author & date	Population, No. of studies & No. of participants	Objectives	Main results	Location & applicability to UK[5]
				A
Wulsin 1999	Persons suffering from depression; suicide completion; 57 studies 132,128 participants	To systematically review the literature on the mortality of depression	Of the 57 studies included in this review, 29 (51%) showed a positive relationship between depression and increased mortality, 13 (23%) showed a negative relationship, and 15 (26%) had mixed results. The authors found that there were too few well-controlled studies that were comparable, to develop a reliable estimate of the mortality risk associated with depression. Only six studies controlled for more than one of the four major mediating factors: severity of physical illness, smoking, alcohol or suicide. Results were grouped as follows: group one included psychiatric patients identified via a psychiatric assessment or diagnosis, group two included a 'community' sample identified by self report measures, and group three consisted of those medical or community samples assessed by structured interview, comparing depressed to non-depressed and controlling for physical illness. Suicide accounted for less than 20% of the deaths in the samples of patients identified by psychiatric diagnosis or assessment, and less than 1% in the medical and community samples. Depression appears to increase the risk of death by cardiovascular disease, especially in men, but depression does not seem to increase the risk of death by cancer. The authors stated that the lack of homogeneity and the variable methods used between studies made it impossible to take the meta-anlaysis further.	USA, Canada, Sweden, Norway, UK (including Scotland based studies), Denmark, Australia, Germany, Finland, Belgium A

Evidence tables for protective factors

First author & date	Population, relevant outcomes & No. of participants	Objectives	Research design	Main findings	Location & applicability to UK
Apter 1997	Suicide attempter inpatients compared with non-attempt inpatients and also non-patients N=55 suicide attemtpers, 87 non-attempters, 81 non-patient controls	To identity defence mechanisms that characterize adolescents with a range of suicidal behaviours and to differentiate them from nonsuicidal adolescents.	Case control	This study explored 'ego defences', which are mechanisms used to protect the ego. In the case of suicidal behaviour, the 'defences' might be aggression directed towards the self, or other negative or self-destructive behaviours. Using $p<.05$ as the value for significance, the following significant results were found. On the Life Style Index (LSI) suicidal adolescent patients scored significantly higher on denial, displacement, repression, and total ego defence mechanisms than the nonpatients. On the Ego Defence Scale (EDS) they scored higher on regression, denial, projection, introjection, repression, and total defences and lower on sublimation. LSI scores on displacement (higher) and on compensation (lower) distinguished suicidal from nonsuicidal inpatients. Denial and regression correlated positively and sublimation correlated negatively with both suicidal and violent behaviors. Introjection and repression correlated with suicidal behaviour only. However, while the LSI identified significant ego defence mechanisms that distinguished suicidal from non-suicidal patients, the EDS did not..	Israel C
Benda 2003	Homeless veterans; substance misusers; suicide attempt N=600	To determine what factors discriminate between nonsuicidal veterans, those who had suicidal thoughts, and persons who had attempted suicide.	Questionnaire survey (quantitative)	Several factors were considered based on attachment theory, including caregiver attachment, sexual abuse, physical abuse, resilience, self-efficacy, and self-esteem. Suicide attempters were discriminated from others by psychiatric comorbidity, early physical or sexual abuse, severity of substance abuse, and longevity of drug use and homelessness. In contrast, the discriminators between nonsuicidal homeless substance abusers and others were elements of attachment and commitments such as marriage, employment, and religiosity.	Midwest, USA C
Chandy 1996	Sexually abused young people; suicide attempts	To explore the protective factors that helped young people overcome vulnerability	cross-sectional	Those with a history of sexual abuse had a significantly higher suicidal involvement than controls and scored higher for suicide risk. 30.5% of sexually abused teenagers reported past suicide attempts compared with 16.6% in the control group. Suicide risk (high or very high) was calculated as 19.8% for the	USA C

First author & date	Population, relevant outcomes & No. of participants	Objectives	Research design	Main findings	Location & applicability to UK
	N=1011 (abused), 1011 comparison group	associated with sexual abuse		sexually abused group and 11.2% for the other group. Significantly higher numbers of the index group had poor school performance, higher rates of pregnancy, and substance misuse. 83 members of the index group (high risk of suicide) were classed as resilient using these parameters. [No confidence intervals were provided for the ORs and p values for all were p<= 0.002.] Protective factors were related to substance use at school, with those linked to high substance use being classed as non-resilient with an OR of 1.61. Mother's use of alcohol on a daily or weekly basis was also associated with non-resilience (OR 1.50). Non-resilience was also associated with those who had higher concerns/worries about sexual coercion (OR 1.75) and had experienced two or more stressful events in the family during the past year (OR 1.09). Resilient young people perceived themselves as healthier than others (OR 1.58) and were more likely to report the presence of a nurse or clinic at school (OR 1.17). Reporting themselves as religious or spiritual was also associated with increased resilience (OR 1.32) as was living with both biological parents (OR 1.78), who cared about them a bit or very much (OR 1.78).	
Chandy 1997	Young men who were sexually abused and controls; suicide attempt N=370 (abused) and 370 controls	To explore the protective factors that help male victims of sexual abuse to overcome the vulnerability associated with this.	cross-sectional	No CIs were provided but all results had a significance of p<=0.004. Out of the index group, 39 were classed as resilient in accordance with the criteria of school performance, suicide risk and substance misuse. The most powerful variable was maternal education, where young people with mothers educated beyond high school were associated with resilience (OR 1.61). [There was an error in the results as this was noted as non-resilience whereas the discussion clearly points to this as a protective factor.] Being in control of behaviour, thoughts and emotion was also positively associated with resilience (OR 1.02) as was the perception that their parents cared about them (OR 2.72), and less perceived drug use by other students (OR 1.35) and perceived supportive school (OR 1.11).	USA, Minnesota C

First author & date	Population, relevant outcomes & No. of participants	Objectives	Research design	Main findings	Location & applicability to UK
				Those who reported stressful events in the family in the past year were 1.35 times more likely to be classed as non-resilient.	
Chapman 2005	Female prisoners; suicide attempt N=105	To explore the association between various risk and protective factors with suicide attempts in a female prison inmate population. A secondary objective was to check whether the risk and protective factors remained when controlling for hopelessness.	cross-sectional questionnaire survey incorporating various measurement tools.	Female inmate participants were given structured diagnostic assessments of antisocial and borderline personality disorders and substance dependence, as well as measures of depression, hopelessness, problem-focused coping styles, and reasons for living (RFL). There was a high lifetime prevalence of past suicide attempts, with 38.1% having made at least on attempt. Protective factors explored included reasons for living and problem-based coping and were used to predict suicide attempts (SA). Negative associations with SA were fear of social disapproval (-.20), and survival and coping beliefs (-.54). In the first step of the Step 2 hierarchical regression, the six RFL scales accounted for a third of the variance in SA ($R2 = .33$, $p < .01$); however, survival and coping beliefs was the only variable uniquely associated with SA ($\beta = -.37$, $p < .01$). In the second step, hopelessness significantly predicted SA ($\beta = .25$, $p < .01$), and the effect of survival and coping beliefs became nonsignificant although it approached significance ($\beta = -.23$, $p = .09$). The problem-focused coping scales were negatively associated with SA ($rs = -.16$ to $-.30$), except for the Instrument Support Scale. In the first step of the regression, ($R2 = .10$, $p < .05$), none of the five problem-focused coping scales predicted SA. In the second step, only hopelessness predicted SA ($\beta = .42$, $p < .01$).	not stated but appears to be USA C
Chesley 2003	Suicide attempters recruited via newspaper adverts N=50	To understand the experience of the suicidal individual and to identify factors that contribute to survival following a suicide attempt.	cross-sectional postal questionnaire survey	Open-ended questions were analysed thematically then frequencies and percentages calculated for each theme and frequency data was calculated for closed questions. When questioned about what prevented them from succeeding in their suicide attempt, 49% responded that it was due to the intervention of another person (including family or professional); 22% changed their minds and looked for help; 18% had not taken enough medicine or had not succumbed to the attempt. The question around what was preventing future attempts gained responses: 13.5% said health professional intervention; 10.4% developing a	USA C

First author & date	Population, relevant outcomes & No. of participants	Objectives	Research design	Main findings	Location & applicability to UK
				sense of self-empowerment; and 10.4% achieved personal/professional success; 10% new outlook on life. Most responded with comments related to having reasons for living. In repsonse to the question 'Has someone or something made a difference in keeping you alive?', 18% said children; 1 5% treatment by health professional; 15% self-empowerment; 14% spirituality; 22% personal relationships; 4.5% personal and professional success; 3% change in attitude; 2% medication; 2% support groups; 2% sobriety; 1% structure in daily life; 1% lifestyle change. A question asking how people learned to cope with suicidal feelings received the following responses: 12% medical treatment; nearly 10% coping through talking to people and asking for help; 10% keeping busy, distracting themselves.	
Coker 2002	Female victims of domestic abuse; suicide attempt N=1152	To determine associations between intimate partner violence (IPV) and mental health outcomes and to assess the protective role of abuse disclosure and support on mental health among abused women.	cross-sectional	The protective factor data was related to an initial discussion of relative risk calculated for each of the outcomes. Inter partner violence (IPV), defined as sexual, physical, or psychological abuse, was associated with poor perceived mental and physical health, substance abuse, symptoms of posttraumatic stress disorder (PTSD), current depression, anxiety, and suicide ideation/actions. Among women experiencing IPV and controlling for IPV frequency, higher social support scores were associated with reduced risk of suicide attempts (adj RR 0.6, 95% CI 0.4, 0.9). Among abused women, higher religiosity was not associated with reduced risk of suicide.	USA C
Cooperman 2005	HIV-positive women, NY; suicide attempt N=207	To explore the prevalence, timing, and predictors of suicidal ideation and attempted suicide in a sample of HIV-positive women in	cross-sectional	Twenty-six percent of the women reported attempting suicide since their HIV diagnosis and 63% of these reported that the attempt was related to their diagnosis. 44% were asymptomatic, 33% were experiencing symptoms and 23% had AIDS. 81% unemployed; 73% of the women had at least one child. The mean level of social support (using the UCLA Social Support Inventory) received was 2.83 where (α = .90). (SD = .96, range 1.00–5.00). Women in the	USA, inner city New York C

First author & date	Population, relevant outcomes & No. of participants	Objectives	Research design	Main findings	Location & applicability to UK
		New York City.		sample had a high level of spirituality (M = 3.34, SD = .58, range 1.00–4.00). An AIDS diagnosis (OR 2.81), sexual and physical abuse (OR 1.52), psychiatric symptoms (OR 2.95), having children (OR 2.82, $p<0.05$) and being employed (OR 4.55) were all significant predictors of suicidal ideation (R^2 = .40) and attempts. [ORs given for suicide attempts]. Despite the original hypothesis, those with children or those who were employed were significantly more likely to have suicidal thoughts or attempt suicide. Substance use and social support were not significant predictors of either ideation or attempts, and spirituality significantly predicted only ideation.	
Dervic 2006b	In-patients with CBPD compared with depressed patients; suicide attempts N=357	To explore the potentially protective role of moral objections to suicide (MOS) against suicidal behaviour in patients with cluster B personality disorders (CBPD) or depression.	Case control	The study confirmed that patients with comorbid Cluster B Personality Disorders had fewer moral objections to suicide and reported more previous suicide attempts, in line with literature that suggests that this group have a higher risk of suicide in general. In logistic regression, fewer MOS/religious beliefs , lower coping potential and higher aggression level were associated with suicide attempt. A CBPD diagnosis did not affect the relationship between MOS and suicide attempts as MOS protected against suicide to the same extent in those with or without this diagnosis. Younger age (OR=0.964, 95% CI = 0.94-0.98) and lack of religious affiliation (OR=0.512, 95% CI = 0.27-0.94) were independently associated with suicide attempt and marital and parental status were not.	USA C
Donald 2006	Medically serious suicide attempters and matched controls N=95 + 380 controls	To investigate risk and protective factors for medically serious suicide attempts among young Australian adults.	Case control	Protective factors included social connectedness (OR=0.29, 95% CI = 0.17-0.49), problem-solving confidence (OR=0.18, 95% CI = 0.09-0.36) and locus of control (OR=0.51, 95% CI = 0.29-0.89). There was a trend for social connectedness to be more protective among those with high rather than low levels of depressive symptomatology (OR=0.17, 95% CI =0.09-0.36), and among smokers (OR=0.12, 95% CI = 0.05-0.25) rather than non-smokers. Gender did not have a statistically significant effect and immediate family support was not found to be protective.	Queensland, Australia; large city C
Driver 2004	Women -	To assess the effect of	Case control	There was no difference in the percentage of childless women when comparing	UK,

First author & date	Population, relevant outcomes & No. of participants	Objectives	Research design	Main findings	Location & applicability to UK
	suicide completers N=60	having offspring, dependant offspring (<18 years), non-dependant offspring (>18 years) and no offspring on suicide rates in women. Also to ascertain whether the offspring living at home or away from home altered the outcome.		the female suicide population of Rotherham with the general female population. However, females with offspring living at home regardless of age were significantly underrepresented in this sample ($P < 0.001$). The findings supported the null hypothesis that having children (in general) did not protect against suicide as 80.3% of the suicide completers has children. However, having dependent children (less than 18 yrs old) decreased the risk of suicide. 13.3% of the suicide completers had children under 18yrs compared with 43.2% of the general population (chi-squared = 46.3; d.f. = 2). This was also supported by the finding that having children living at home (of any age) was associated with lower suicide rates (18.3% of suicide completers had children living at home compared with 61.3% in the comparison population.) This might be explained by the greater social isolation of those women whose children had left home, as 33.3% of the suicide completers lived alone, compared with only 14.3% of the Rotherham female population.	Rotherham A
Eisenberg 2006	Lesbian, gay or bisexual young people; suicide attempts N=21,927 (2255 LGB)	To examine four protective factors (family connectedness, teacher caring, other adult caring, and school safety) and their association with suicidal ideation and attempts among lesbian, gay and bisexual young people.	cross-sectional	Over half of gay, lesbian or bisexual (GLB) students had thought about suicide and 37.4% reported a suicide attempt. GLB youth reported significantly lower levels of each protective factor than their non-GLB peers. For example, 15.6% of GLB females reported high family connectedness compared with 28.3% of non-GLB females ($x2 = 60.5$). Similarly, there was a difference of 10 percentage points between GLB males reporting a high degree of safety in school (20.5%) and non-GLB males reporting safety in school (30.7%, $x2 = 61.8$). Family connectedness, adult caring, and school safety were significantly protective against suicidal ideation and attempts. Risk associated with a GLB sexual orientation is largely mediated through protective factors.	Minnesota, USA C
Elliott 2001	Self poisoners; suicide attempts	To explore the relationship between level of hopelessness and stressful life events	cross-sectional (Interviews conducted 24 hrs after	Pearson's product-moment correlations were conducted to examine the relationships between hopelessness and depression with suicidal intent. These confirmed the positive correlation between hopelessness and suicidal intent ($r(78) = 0.6$, $p < .001$) when depression is controlled for. The mean score on the	Wales A

First author & date	Population, relevant outcomes & No. of participants	Objectives	Research design	Main findings	Location & applicability to UK
	N=80	measured across the two years preceding the attempt, and coping strategies drawn on.	admission)	COPE for problem-focused strategies was 43.8 (SD = 10.5) and for emotion-focused strategies 43.2 (SD = 9.0). Pearson's product moment correlations revealed a significant negative correlation (r(78) = –0.34, p = .001, one-tailed) with use of problem-focused coping strategies, and a negative correlation that approached significance (r(78) = –0.17, p = 0.063, one-tailed) with use of emotion-focused coping strategies. Patients who scored higher on the hopelessness scale tended to employ less problem-focused coping, although the trend for them to employ less emotion-focused coping only approached significance. The analysis also explored the interaction between variables to determine whether coping strategies might have an effect on stress. Stress and problem-focused coping had a linear and additive effect on hopelessness but emotion-focused coping did not reach significance.	
Everall 2006	Adolescents who were suicide attempters N=13	To understand how adolescents overcome suicidality	Semi-structured interview	The authors found four main domains of resilience, which they refer to as social processes, emotional processes, cognitive processes and purposeful or goal directed action. 1. SOCIAL PROCESSES All had at least one significant relationship that they turned to for social support. Participants sought out environments where they could gain peer support and a sense of belonging e.g. church youth group, workplace. During difficult times, caring friends and/or partners were significant sources of help. For some participants, a supportive relationship with one or more parents was key to the healing process. Three participants found adult support through teachers at school, family friends or professional psychologists or counsellors. 2. EMOTIONAL PROCESSES One of the most important things expressed by participants was the	Canada C

First author & date	Population, relevant outcomes & No. of participants	Objectives	Research design	Main findings	Location & applicability to UK
				ability/willingness to face difficult emotions or anger. Some reported extreme fear when hitting 'rock bottom' and facing that fear provided the motivation towards recovery. Participants were all able to express their feelings to at least one other person, which helped them to process the emotion. Journal writing was another means by which participants expressed their emotions. One participant kept an online diary, and others also wrote poetry. 3. COGNITIVE PROCESSES Participants reported gaining a better perspective on their lives: focusing on the positive aspects rather than negative, and good things about themselves. Some found that by focusing on the present rather than the past allowed them to take one day at a time. Along with the sense of perspective and more positive outlook, participants gained the realisation that they were in control and could choose whether or not to be happy. This realisation was aided in some cases by contact with a therapist or bibliotherapy. 4. PURPOSEFUL AND GOAL DIRECTED ACTION A sense of control and self-efficacy was enhanced by taking action to change their situations. This initial change often involved a fresh start - such as leaving home, moving cities; while for others, change was simply made in small steps where taking action was simply keeping busy. Being independent was also a strategy that helped participants. This ranged from leaving destructive relationships, changing peer groups to ones that were more positive in outlook, giving up alcohol or drug use and so on. These changes came together to develop a greater sense of self-esteem and confidence in being able to handle change in the future. This allowed participants to plan further ahead and develop positive goals for the future. These new goals and sense of optimism created a greater sense of purpose and meaning in life.	
Fenaughty	Young gay	To explore resiliency to	Semi-	1. POSITIVE STEREOTYPES OR REPRESENTATIONS	New

First author & date	Population, relevant outcomes & No. of participants	Objectives	Research design	Main findings	Location & applicability to UK
2003	men; suicide attempts N=8	suicide in young gay men.	structured interview	Positive images of gay men in the media were regarded as helping young men, particularly at the 'coming out' stage of their lives. Items such as the gay radio hour helped to provide information about groups to attend and increased the sense of belonging. Participants thought that this would be particularly helpful to gay youth living in rural areas who may experience stronger sense of alienation. The media provided positive role models and broke down stereotypes. Role models of the same ethnicity were highlighted as important in breaking down the dual discrimination of race and sexual orientation. 2. POSITIVE FAMILY ACCEPTANCE Families being positive about homosexuality helped some participants to come out. Others stated that although their families were uncomfortable about it, were still generally supportive. Other ways that parents were supportive was in recognising that their son was being bullied at school and changing schools, to create a more positive experience for one young man who attemtped suicide. Having parents to count on, boosts the sense of self-efficacy and resilience. 3. SCHOOL AND PEER SUPPORT Schools that offer LGB-friendly environments reduce the chances of victimisation and associated stresses. They may also enhance self esteem and confidence. Having support from 'straight' peers may act as a protective factor as does support from others in the school - caring teachers etc. Support from a respected figure can boost resiliency. 4. SUPPORT NETWORK PARTICIPATION Support from others who are of the same sexual orientation is also very important to provide a sense of shared experience. This also applies to actual support groups, that may offer first contact to young men with others who are gay, allow access to further information sources (e.g. safe sex and HIV), and to	Zealand C

First author & date	Population, relevant outcomes & No. of participants	Objectives	Research design	Main findings	Location & applicability to UK
				'normalise' being gay. This can sometimes also provide living space for those who need to leave home for a time - often giving respite that later leads to repairing relationships with family. 5. HIGH SELF ESTEEM Young people with positive perceptions of gay sexuality are more likely to maintain self esteem during the coming out phase. Those with high self esteem are less likely to attempt suicide. 6 COPING MECHANISMS One participant used the strategy of listing all of the famous gay people that he knew of to bolster his self esteem. Another participant used problem focussed coping to strengthen his social networks after coming out in order to gain affirmation. 7 LIFE ON THE SEESAW Coming out is one of the most stressful experiences for gay youth and differences in suicidality may be related to the amount of resiliency that individuals have rather than the amount of stress. Positive social acceptance is one of the key factors to boost resiliency. There is a balance between risk and resiliency that is on a seesaw - with suicide at one end and resilience at the other.	
Fergusson 2003	Young people with depressive disorders; suicide attempts	To examine factors that influence vulnerability/resiliency of depressed young people to suicidal ideation and suicide attempt.	cross-sectional (longitudinal survey over 21 years, data collected at 20 different periods).	Young people who developed major depression had increased rates of suicidal ideation (OR=5.4; 95% CI 4.5–6.6) and suicide attempt (OR=12.1; 95% CI 7.9–18.5). However, the majority of depressed young people did not develop suicidal ideation or make suicide attempts, suggesting that additional factors influence vulnerability or resiliency to suicidal responses. Factors influencing resiliency/vulnerability to suicidal responses included: family history of suicide; childhood sexual abuse; neuroticism; novelty seeking; self-esteem;	New Zealand C

First author & date	Population, relevant outcomes & No. of participants	Objectives	Research design	Main findings	Location & applicability to UK
	N=1063			peer affiliations; and school achievement. These factors operated in the same way to influence vulnerability/resiliency among those depressed and those not depressed.	
Flouri 2002	School aged children and young people; suicide attempts N=2560 (included because responded to the question re suicide attempt; total sample n=2722)	To test the hypothesis that perceived parental involvement is negatively associated with self-reported suicide attempts in adolescence when both risk and protective factors are controlled.	cross-sectional	Compared to adolescents who had not made a suicide attempt, suicide attempters tended to report lower self-confidence ($t = 6.36$, df:251.57) and lower parental involvement ($t = 7.84$, df:241.33). Self-reported suicide attempters were also more likely than nonattempters to report that they did not live with both their parents ($\chi2 = 53.61$, df:1, $p < .001$), that they did not feel able to make new friends ($\chi2 = 64.04$, df:1), that they had received free school meals at some point during their schooling ($\chi2 = 7.05$, df:1), that they had been in trouble with the police ($\chi2 = 127.96$, df:1), and that there has been conflict in their family ($\chi2 = 33.11$, df:1). Suicide attempters were also more likely than nonattempters to have suicidal thoughts ($\chi2 = 548.87$, df:1), to have been bullied in school ($\chi2 = 30.55$, df:1) and to report that they use an illegal drug or alcohol when they feel stressed ($\chi2 = 91.05$, df:1). In fact, a sizeable 31.6% of the sample reported that they had had suicidal thoughts, and 29.9% reported that they "have a drink" or "take an illegal drug" when stressed. There were no differences in gender ($\chi2 = .18$, df:1), age ($t = 1.72$, df:2397) or presence of role models ($\chi2 = .17$, df:1) between the two groups. Not residing with both parents was strongly associated with suicide attempts. The association between parental involvement and offspring suicidal behaviour was not stronger for sons than for daughters (OR = 1.00). An interaction term between family structure and parental involvement was calculated to reveal that the interaction between family structure and parental involvement was insignificant (OR = 1.02), which suggests that the association between parental involvement and adolescent suicidal behaviour is not weaker when offspring experienced family disruption than when offspring grew up in intact two-parent	UK A

First author & date	Population, relevant outcomes & No. of participants	Objectives	Research design	Main findings	Location & applicability to UK
				families.	
Garroutte 2003	American Indians; suicide attempts N=1640 (total), 1456 included as completed all questions	To explore the association of spirituality to the lifetime prevalence of attempted suicide in a probability sample of American Indians.	cross-sectional	Commitment to Christianity was assessed using a measure of beliefs. Commitment to tribal cultural spirituality (or forms of spirituality deriving from traditions that predate European contact) was assessed using separate measures for beliefs and spiritual orientations. Results indicated that neither commitment to Christianity nor to cultural spirituality, as measured by beliefs, was significantly associated with suicide attempts (ptrend for Christianity=0.22 and ptrend for cultural spirituality=0.85). Conversely, commitment to cultural spirituality, as measured by an index of spiritual orientations, was significantly associated with a reduction in attempted suicide (ptrend = 0:01). Those with a high level of cultural spiritual orientation had a reduced prevalence of suicide compared with those with low level of cultural spiritual orientation. (OR=0.5, 95% CI=0.3, 0.9). This result persisted after simultaneous adjustment for age, gender, education, heavy alcohol use, substance abuse and psychological distress.	USA D
Hirsch 2006	Depressed in and out-patients; suicide attempt N=202	To test the hypothesis that future orientation is associated with lower levels of suicide ideation and lower likelihood of suicide attempt in patients being treated for depression.	cross-sectional	The study found that higher future orientation scores were associated with lower current suicidal ideation, less intense suicidal ideation at its worst point, and lower probability of a history of attempted suicide after accounting for covariates. Future orientation was not associated with current attempt status. People with higher scores for future orientation were less likely to ever have attempted suicide (OR 0.94, 95% CI 0.89-0.99). However, future orientation was not associated with current attempt status. Older participants were less likely to have attempted suicide, but there were no differences related to gender.	Rochester, NY, USA C
Husler 2005	At risk (of school dropout, substance misuse, or	To propose and test a Structural Interactive Path (SIP) model of adolescent risk and protective factors that	cross-sectional	The model showed that negative mood (depression and anxiety) predicted two paths. One path led from negative mood to suicidality and from there to substance use. The other path led directly from negative mood to illness. Traditional protective factors (good relationships, secure identity) protected against the negative mood-suicide-substance path, but not against the negative	Switzerland C

First author & date	Population, relevant outcomes & No. of participants	Objectives	Research design	Main findings	Location & applicability to UK
	deviant behaviour) adolescents attending a national secondary prevention program centre; suicide attempts N=1028	includes illness, suicidality and use of tobacco, alcohol, and cannabis as interacting outcome measures.		mood-illness path. For all ages and both genders, secure self was related to a good emotional and cohesive relationship with parents (0.39 to 0.60). A good relationship with parents protects against substance use overall, but more for girls than for boys (−0.25 to −0.43; older boys=−0.11 ns). For girls good relationships with their families were marginally protective against suicide (−0.14 to −0.31). Good parental relationships protected girls against suicidality (−0.14 and −0.31) and substance use (−0.25 and −0.40). A good relationship with the parents was a strong protective factor for younger boys against substance use (−0.43), but had no protective effect for older boys.	
Israelashvili 2006	Female adolescents attending a hospital emergency room because of suicidal behaviour; their mothers and controls; suicide attempts N=32 with suicidal behaviour, 32 mothers, 32	To explore whether female adolescents' suicidal behaviour is an imitation of their mothers' tendency to escape active and problem-focused coping.	Case control	The authors reported few statistically significant differences between suicidal behaviour (SB) and non-SB were found, both for female adolescents and for their mothers. Nevertheless, significant age effects were evident, indicating that mothers tend to use more problem-focused coping while adolescents tend to use more disengagement. Moreover, mother-adolescent correlations were significant only for non-SB, except for a significant negative correlation between SB adolescents and their mothers in seeking emotional social support. Findings showed that differences reaching the level of significance between the adolescent groups differences should be attributed to only one way of coping – non-SB adolescents, in comparison to SB adolescents, tend to use significantly more Planning [F (1,60)=7.68]. Difference in ACT measure of Active Coping (SB adolescents – M=3.59, SD=1.98; non-SB adolescents – M =3.77, SD=1.78) was also not significant. No significant difference was found either between the SB and the non-SB mothers. However, an age effect was found, indicating that mothers more than their adolescent daughters tend to use Active Coping [F (1,60)=3.96]), Suppression of Competing Activities [F (1,60)=5.74], Acceptance [F (1,60)=4.93], and Mental Disengagement [F (1,60)=6.05].	not stated C

First author & date	Population, relevant outcomes & No. of participants	Objectives	Research design	Main findings	Location & applicability to UK
	controls for SB.			Finally, an interaction effect was found for Seeking for Emotional Social Support [F (1,22)=4.41], indicating that non-SB adolescents and SB-mothers use this way of coping more than SB-adolescents and non-SB mothers.	
Kaslow 2005	African-American suicide attempters N=200 (100 SA and 100 controls)	To explore a range of potential risk and protective factors for suicide attempt among 200 African-American men and women receiving care at a large, public, urban hospital.	Case control	The study examined the effect of the following potential risk factors for suicide attempt: life hassles, partner abuse, partner dissatisfaction, and racist events; as well as the following potential protective factors: effectiveness of obtaining resources, social embeddedness, and social support. Using logistic regression, suicide attempter status was predicted by two independently significant social variables: one risk factor (life hassles) and one protective factor (social support). Male versus female suicide attempters were not distinguished by the social variables. The odds ratio associated with social support, was 0.309, indicating that for each unit increase in social support, participants were 30% as likely to be attempters than non-attempters. This model, including life hassles and social support, successfully classified 77.1% of the cases, $\chi 2$ (7, N = 144) = 67.71, deviance of log likelihood (−2LL) = 131.48. Some 74% of controls and 76% of attempters were correctly classified.	USA, urban hospital C
Kelly 2000	Patients with major depression or borderline personality disorder; suicide attempt N=80	To explore the relationship between recent life events and social adjustment in patients with major depression or borderline personality disorder.	cross-sectional	34 patients with major depression, 24 with borderline personality disorder and 22 with co-morbid major depression and borderline personsality disorder were included in this study. There were no significant differences between these groups according to race, gender, marital status, socio-economic status or religious affiliation. Suicide attempters reported more recent life events and scored lower on a measure of social adjustment in their families (attempters mean=2.0 +- v non-attempters mean=0.8 +- 0.9, t= -3.8, df= 74). They also scored lower on social adjustment in the extended family (attempters mean= 2.3 +- 0.7 v non-attempters mean= 1.8 +- 0.5, t= -3.2, df= 76) and also lower on overall social adjustment (attempters mean= 2.8 +- .63 v non-attempters mean= 2.3 +- 0.6, t= -3.3, df= 78	USA C

First author & date	Population, relevant outcomes & No. of participants	Objectives	Research design	Main findings	Location & applicability to UK
				where higher scores indicate lower social adjustment). Borderline disorder and borderline or depressed patients were more likely to have attempted suicide than patients with major depression only. Recent life events did not predict attempter status. Lower social adjustment in the immediate family and lower overall social adjustment were predictive of suicide attempter classification, regardless of diagnosis. Borderline disordered patients low on overall social adjustment were over 16 times more likely to have attempted suicide than patients diagnosed with major depression only.	
Kidd 2006	Adolescents; suicide attempts N=9142	To explore the impact of social relations on suicide attempt in a longitudinal study of adolescents.	cross-sectional (longitudinal, 2 wave design)	Adolescents who felt more connected to their parents were less likely to commit suicide (OR = .60). There were no main effects for school or peer relations. Interactive effects were explored for gender, depression, peer relations, school relations, parent relations and suicide attempts, but only the 5-way interaction reached a level of significance. Next, the study examined the significance of 3-way interactions among parent relations, peer relations, and school relations by gender and prior attempts. There was a 3-way interaction for boys with a history of suicide attempts (OR = .32) but this was not the case either for boys without attempt histories or for girls regardless of attempter or non-attempter status. Further analysis revealed that boys who were suicide attempters with poor peer relations, good school relations appeared to be associated with parent relations providing a more powerful protective effect (OR = .19), compared to when school relations were rated low (OR = .53)	USA C
Kirmayer 1998	Inuit youth; suicide attempt N=203	To identify potential risk and protective factors associated with attempted suicide among Inuit youth.	cross-sectional (secondary analysis of survey data)	At the bivariate level, positive correlates included substance use (solvents, cannabis, cocaine), recent alcohol abuse, evidence of a psychiatric problem, and a greater number of life events in the last year. Risk was gender related but results are reported below for protective factors only. Regular church attendance was negatively associated with attempted suicide. 26% of regular church attenders reported suicide attempts compared with 50% of regular church attenders who did not attempt suicide ($p<0.01$). A	Quebec, Canada D

First author & date	Population, relevant outcomes & No. of participants	Objectives	Research design	Main findings	Location & applicability to UK
				significantly higher proportion of female respondents attended church regularly in the last year (55% versus 30% for males, x2 = 11.1; df = 1). The authors phrase this point differently in the discussion where they claim that according to their bivariate analysis, youth who attended church regularly were about a third as likely to attempt suicide as those who did not. When factors such as psychiatric illness were considered, church attendance was no longer significant.	
Kraut 2003	Residents of Manitoba, Canada; attempted suicide N=43188	To compare the relationships of unemployment, part-time work, non-labour force participation, and full-time work with attempted suicide.	cross-sectional	An analysis of the variables explored revealed predictors for attempted suicide. Residential stability (OR 0.59, 95% CI 0.39-0.91) and marriage (OR 0.61, 95% CI 0.40-0.94) were found to be protective factors against suicidal behaviour. In exploring employment (for weeks worked in 1985) and suicide attempt after the census, the reference category was working 52 weeks. In comparison to this, a dose-response relationship was obsrerved, increases for the ORs for working 26-51 weeks (OR 1.40, 95% CI 0.67-2.90), working 1-25 weeks (OR 2.22, 95% CI 1.05-4.70), and not working at all (OR 2.90, 95% CI 1.04-8.09). In a stratified analysis to determine the importance of employment across a range of sub-groups, it was found that unemployment was associated with higher ORs of attempted suicide in all groups. This distinguished between those who were out of the labour force and unemployed. Risk was increased for those who did not live with someone in full-time employment and/or households with lower incomes.	Canada C
Lam 2004	Adolescents; suicide attempts (medicially serious and less serious) N=2427	To examine specific individualistic and traditional values in the context of suicidal ideation and behaviors in Hong Kong among adolescent youths.	cross-sectional (schools-based survey also drawing on sexual health survey data)	Data is separated into suicide attempts requiring medical attention and suicide attempts that did not. All groups endorsed individualistic and traditional values, with no difference according to gender. However, there were significant differences between the age groups 15 yrs or younger, compared to 16 yrs or older. Older youth endorsed both the individualistic (M's=4.36 versus 4.06) t (2240)=5.23; and the traditional values more than younger ones (M's=3.79 versus 3.63) t (2241)=3.32. While the traditional value of respect for elders and obedience, protected against suicidal ideation in both groups, traditional values	Hong Kong D

First author & date	Population, relevant outcomes & No. of participants	Objectives	Research design	Main findings	Location & applicability to UK
				did not influence the seriousness of attempts (i.e. attempts requiring medical attention v less serious attempts). Among both boys and girls who attempted suicide but did not require medical attention, those who endorsed the individualistic value were less likely to make a serious attempt. (Boys: OR 0.71, 95% CI 0.59-0.85; Girls: OR 1.07, 95% CI 0.91-1.25). However, when controlling for family relationships and symptoms of depression, the value of individualism had no influence on girls' suicidal behaviour while it was associated with lower rather than higher risk for boys. The reverse was true for the traditional values of obedience and respect for elders: this showed a protective effect in girls but not boys.	
Lorant 2005	General population; completed suicides N=25476	To explore whether being married is a protective factor against socio-economic inequalities in suicide, and whether any such buffering effect varies between countries.	cross-sectional	Among the non-married, the lower educational group had an increased risk of dying by suicide compared to the higher group (OR = 1.45). Inequalities among the married were also evident but less pronounced (OR = 1.29). In all countries or regions except Austria, the lower educational group had a higher risk of suicide mortality among the non-married than among the married. The buffering effect of being married was not observed for elderly individuals (65 and over). Among younger individuals, the buffering effect of being married on relative inequalities in suicide was stronger in Madrid, Denmark, Norway and Switzerland (but significant only for Denmark and Norway). There was no indication that countries with stronger welfare policies or lower divorce rate had a lower buffering effect. Bearing in mind the limitations of using educational attainment as an indicator of SES (particularly for the elderly population who generally had lower educational attainment levels), the authors also tested the indices of housing tenure in some of the countries where this was appropriate. The results were similar: among the non-married, non-owners had an increased risk of suicide compared to owners (OR = 1.28 (95%CI :1.22–1.35)); the increased risk among the married was also significant but weaker (OR = 1.19 (95%CI: 1.12–1.26)).	Austria, Belgium, Denmark, Finland, Switzerland, Turin, Madrid and Norway C

First author & date	Population, relevant outcomes & No. of participants	Objectives	Research design	Main findings	Location & applicability to UK
				An analysis of the buffering effect of marital status according to gender confirmed that being married had a greater impact on suicide risk among men (OR = 1.42) than among women (OR = 1.10).	
Malone 2000	In-patients with major depression; suicide attempt N=84 (45 suicide attempters + 39 non-attempters)	To explore the hypothesis that "reasons for living" might protect or restrain patients with major depression from making a suicide attempt.	cross-sectional	Patients who had not attempted suicide scored higher on the various items in the reasons for living inventory. They expressed more feelings of responsibility toward family, more fear of social disapproval, more moral objections to suicide, greater survival and coping skills, and a greater fear of suicide than those who had attempted suicide. In exploring the lethality of attempts, moral objection to suicide was the only reason for living that was significantly stronger in the subjects with low-lethality suicide attempts (mean=13.1, SD=7.0, N=10) than in those with high-lethality attempts (mean=8.7, SD=5.2, N=35) (t=–2.00, p=0.05). Scores for hopelessness, subjective depression, and suicidal ideation were significantly higher for the suicide attempters. Reasons for living correlated inversely with the combined score on these measures, considered an indicator of "clinical suicidality." Clinical suicidality was highly significantly inversely correlated with reasons for living (canonical correlation = –0.64, likelihood ratio=0.59, df=3, 59, N=62). Neither objective severity of depression nor quantity of recent life events differed between the two groups.	USA C
Mathy 2003	Gay and lesbian adults; suicide attempts N=38204	To explore the combined effects on mental health of marriage as a protective factor and homosexuality as a risk factor.	cross-sectional	There was a significant association between suicidality and sexual orientation in both countries, with homosexual and bisexual people being at higher risk of suicide ideation and attempts. Heterosexual and same-sex marriage appeared to mediate this risk in some, but not all instances. Analysis of variance on Canadian women showed no significant results for relationship status on suicide attempt; although this analysis performed on male Canadians showed significant association between relationship status and suicide attempt ($F = 3.435$, $p<0.05$). US women showed a significant association for relationship status and ideation but not for suicide attempts, with single women more likely to report suicidal ideation than married women. There was a significant association between relationship status and suicide attempts (F = 10.232,	USA and Canada C

First author & date	Population, relevant outcomes & No. of participants	Objectives	Research design	Main findings	Location & applicability to UK
				p<0.001) in US men, since a greater percentage of men who were single or in committed relationships reported suicide attempts. In hierarchical logistic regression analysis, the combined effects of relationship status and sexual orientation significantly increased the goodness of fit for a model predicting suicide attempts in both Canadian (x2 = 8.84, p<0.05) and US (x2 = 16.58, p<0.01) males. Demonstrating the combined effects of sexual orientation and relationship status were a better prediciton of men's suicide attempts than was either variable alone.	
Mathy 2003	Lesbian women; suicide attempts N=176	To explore the effects of religiosity in families of lesbian and bisexual women on suicidal intent, child maltreatment, and timing of self-disclosure of homosexuality.	cross-sectional	The results explore religiosity and childhood maltreatment, religiosity and suicidal intent, religiosity, psychosecual devlopment and self-disclosure (of sexual orientation), religiosity and reactions following self-disclosure. Extremely important religiosity currently was associated with precocious psychosexual development and self-disclosure in the Internet sample only. Very important religiosity currently was associated with psychosexual development and self-disclosure of minority sexual orientation at significantly older ages. These results were discussed in the context of arguments that religiosity may be a risk factor for sexual minorities. Scores for religiosity did not distinguish between suicide attempters (n = 15, M = 0.60, SD = 1.12) and non-attempters (n=67, M = 0.94, SD = 1.06), t = 1.13. Reports of parents' religiosity also did not highlight any difference between attempters and non-attempters.	USA C
Meadows 2005	Low income African-American women who had recent experience of domestic	Protective factors (hope, spirituality, self-efficacy, coping, social support-family, social support-friends, and effectiveness of obtaining resources)	Case control	Specifically, women with high levels of hopefulness were only 16% [95% CI = 0.08, 0.31] as likely to have attempted suicide as women with lower levels of hopefulness. Similarly, for high levels of spiritual well-being, women were only 19% (CI = 0.09, 0.41) as likely; for high levels of self-efficacy, only 30% as likely (CI = 0.15, 0.61); for high levels of coping, only 50% (CI = 0.26, 0.96) as likely; for high levels of social support from family, only 17% (CI = 0.08, 0.36) as likely; for high levels of social support from friends, only 33% (CI =	USA - urban C

First author & date	Population, relevant outcomes & No. of participants	Objectives	Research design	Main findings	Location & applicability to UK
	violence; suicide attempts N=200 (100 suicide attempters + 100 controls)	against suicide attempts were examined in economically, educationally, and socially disadvantaged African-American women who had experienced recent intimate partner violence.		0.17, 0.65) as likely; and for high levels of effectiveness in obtaining resources, women were only 38% (CI = 0.20, 0.74) as likely to have attempted suicide than were women with lower levels of these factors, respectively. After multivariate regression analysis to determine the effect of each of the protective factors, it was found that two of the protective factors were associated with non-attempting when controlling for the other protective factors. Women with high levels of hopefulness were only 25% (CI = 0.11, 0.57) as likely to have attempted suicide as women with lower levels of hopefulness; women who endorsed high levels of social support from family were only 27% (CI = 0.11, 0.68) as likely to have attempted suicide as were women with lower levels of social support from family. Women were also scored according to the number of protective factors, which ranged from 0-7. Women who endorsed three to seven protective factors, AOR = 0.11, CI = 0.04, 0.25, were significantly less likely to have attempted suicide than women endorsing no protective factors. Compared to women who endorsed zero protective factors, women who endorsed three to seven protective factors were only 11% as likely to have attempted suicide.	
Mercy 2001	Suicide attempters and controls N=153 suicide attempters + 513 controls	To determine the association between nearly lethal suicide attempts and exposure to the suicidal behavior of parents, relatives, friends, or acquaintances and to accounts of suicide in the media.	Case control	After controlling for potentially confounding variables, the authors found that exposure to the suicidal behavior of a parent (adjusted OR = 1.5; 95% CI: 0.6, 3.6) or a non-parent relative (adjusted OR = 1.2; 95% CI: 0.7, 2.0) was not significantly associated with nearly lethal suicide attempts. Both exposure to the suicidal behavior of a friend or acquaintance (adjusted OR = 0.6; 95% CI: 0.4, 1.0) and exposure to accounts of suicidal behavior in the media (i.e., having seen any movies, watched any television shows or videos, read any news articles, or read any books or stories during the 30 days prior to the suicide attempt for case subjects or interview for control subjects) (adjusted OR = 0.2; 95% CI: 0.1, 0.3) were associated with a lower risk of nearly lethal suicide attempts.	USA C
Molock	African-	To explore whether	cross-sectional	The paper explores different styles of religious coping based on Pargament et	USA

First author & date	Population, relevant outcomes & No. of participants	Objectives	Research design	Main findings	Location & applicability to UK
2006	American teenagers; suicide attempt N=212	invovlement in public religious behaviours and using different religious coping strategies serve to buffer these teens from suicidal behaviors in African-American teenagers.		al.'s (1988) model: 1) self-directed coping the person is active in problem solving with minimal involvement with a 'higher power'; 2) collaborative coping style is illustrated by an active partnership with God for problem solving; and 3) deferred coping where the person is passive and they expect God to solve their problems. A person might draw on all three styles at different times depending on the context/stressor. The results show that hopelessness and depression were risk factors for suicidal ideation and attempts. Religious coping style was significantly related to suicidal behaviors. Self-directed coping was related to increased hopelessness, depression, and suicide attempts, and collaborative coping was related to increased reasons for living. Gender differences were found in symptoms of depression, religious coping style and religious participation. Although the authors hypothesised that teenagers who used either a self-directed or collaborative religious coping style would be less likely to experience suicidal ideation or attempts, in fact the analysis showed that none of the coping styles were related to suicide ideation. However, there was a significant relationship between self-directed coping and suicide attempts as those using this style were more likely to report having attempted suicide (Beta = 0.04, F = 4.41; $p<0.05$).	C
Nisbet 1996	Community dwelling population; exploring race and gender issues N=16477	To evaluate whether a model of social support can help explain the low suicide rate of Black females.	cross-sectional	The research used data from a cross-sectional US study of the incidence and prevalence of major psychiatric disorders and the utilisation of health and mental health services undertaken between 1980 and 1985. Univariate analyses (ORs and CIs not reported) found that women had a higher suicide attempt rate than men ($p<0.05$), but that the difference was not significant between black women and white women. The authors also modelled the data to examine the relationship of background characteristics (e.g. marital status, number of children) on attempted suicide as mediated by emotional state. Marriage was found to have a protective effect but was stronger for white females than for	USA C

First author & date	Population, relevant outcomes & No. of participants	Objectives	Research design	Main findings	Location & applicability to UK
				black females. Seeking support for friends and family was also found to be protective, whereas seeking support from professional resources was found to be associated with an increase in the likelihood of suicide. The authors suggest that this increase may reflect the population's resistance to seek professional help until their emotional state has severely deteriorated.	
Nonnemaker 2003	American adolescents; suicide attempt N=16306	To examine the association between public and/or private domains of religiosity and adolescent health-related outcomes.	cross-sectional	Sample members could demonstrate both public and private religosity at varying levels, these variables were determined by ratings regarding religious practice given by sample members. Public religiosity was associated with lower emotional distress while private religiosity was not. Only private religiosity was significantly associated with a lower probability of having had suicidal thoughts or having attempted suicide. For attempted suicide, the logit coefficient for public religiosity was -0.07 (0.08) compared with -0.26 (0.08).	USA C
O'Donnell 2004	African-American and Latino teenagers; suicide attempts N=879	To explore and understand the growing problem of suicidality in African-American and Latino teenagers.	cross-sectional	The results for the logistic regression of suicide attempts on sociodemographic and risk and resiliency factors show that neither ethnic identity formation, coping style, school attachment, nor peer support are associated with suicide attempts. Furthermore, religiosity is not significant. By contrast, being female and being Hispanic, compared to African-American, doubles the risk of a reported suicide attempt (OR 2.15, CI = 1.27–3.65; OR 2.99, CI = 1.68–5.31). As with ideation, family closeness is protective (OR 0.64, CI = 0.48–0.86); depression is a risk(OR1.72, CI = 1.34–2.19). However, unmet needs is only marginally significant, and same-gender sex is not significant.	USA, Urban C/D
Oquendo 2005	Latino and non-Latino with Axis 1 diagnosis of major depression, bipolar	To determine whether the Reasons for Living Inventory (RFLI) might capture protective factors against suicidal behavior in Latinos and non-Latinos.	cross-sectional	The Latinos v non-Latinos did not differ significantly on attempter status, number of attempts and suicide intent. Although Latinos were less likely to have made lethal suicide attempts in the past and reported less suicide ideation. The Latino group also scored much higher on the total RFLI score, particularly on the Survival and Coping Beliefs Scale (SCBS), Responsibility to Family Scale (RFS), and the Moral Objections to Suicide Scale (MOSS). In the logistic regression for attempter status, females, subjects with less education, and those	USA Urban C/D

First author & date	Population, relevant outcomes & No. of participants	Objectives	Research design	Main findings	Location & applicability to UK
	disorder or schizophrenia; suicide attempt N=460			with lower scores on the SCBS (p = 0.006, OR 0.99), RFS (p = 0.026, OR 9.71), and MOSS (p = 0.018, OR 1.00) were significantly more likely to be suicide attempters. Being Latino had no independent effect on attempt status. The predictive power for this model was 65%. In the model testing lethality of most medically damaging suicide attempts, older age and lower scores on the MOSS were significantly related to higher lethality of the most severe attempt. As with the model examining suicide attempt status, being Latino had no independent effect on intent or lethality of suicidal behavior.	
Pharris 1997	American Indian and Alaskan Native adolescents with a history of sexual abuse; suicide attempt N=13923	To identify factors protective against the adverse health correlates of sexual abuse in reservation-based American Indian and Alaskan Native adolescents.	cross-sectional	History of sexual abuse was reported by 14.0% (n =991) of the female respondents, and 2.4% (n = 166) of the male respondents. This is a rate that is similar to the majority population. Factors associated with an absence of suicide attempt for females were family attention ($p < .0001$), parental, family, and adult caring ($p < .01$), parental expectations that were not too high ($p < .05$), and belief that school people care ($p < .05$). For males, the only factor associated with absence of suicide attempts was family attention ($p < .05$). Multivariate analysis of protective factors revealed that protective factors against suicide attempts for females were family attention, parental expectations, parental caring, and positive feelings about school. For males, protective factors included feeling positively about school, family caring, involvement in traditional activities, and doing well in school.	USA C/D
Piquet 2003	Hospitalised, adolescent suicide attempters and matched control group N=42 (23 suicide	To compare the coping responses of 23 hospitalized adolescent suicide attempters with those of 19 hospitalized non-attempters matched on diagnosis and demographics.	Case control	The coping responses were classified into: effortful-approach, effortful-avoidance, automatic-approach, and automatic-avoidance. Classification scores were not significantly associated with depression in either group. Although the comparison between groups own perceptions' of effectiveness of coping was not significant, coders' ratings of effectiveness showed that suicide attempters (M = 1.74, SD = 0.54) were less effective than the comparison group ((M =2.58, SD = 0.82) $F(1, 40) = 15.81$, $p < .001$, effect size $n2 = 0.28$. Relative to the comparison group, suicide attempters made fewer effortful-	USA C

First author & date	Population, relevant outcomes & No. of participants	Objectives	Research design	Main findings	Location & applicability to UK
	attempters + 19 controls)			approach and more automatic-approach coping responses, and were judged by trained raters to have coped less effectively. Coders' ratings of greater coping effectiveness among suicide attempters were associated with a greater decline in suicidal symptoms assessed at 6-month follow-up intervals across a 2-year period.	
Svetaz 2000	Adolescents with learning disabilities; suicide attempts N=29780 (1301 with learning disabilities)	To identify differences in emotional well-being among adolescents with and without learning disabilities (LDs) and to identify risk and protective factors associated with emotional distress.	cross-sectional	The study explored emotional distress, suicide and violent behaviour. Suicide attempt is not defined within this study and was simply measured by a self report, yes/no question. Adolescents with LDs who had emotional distress reported eight times the number of suicide attempts than those without emotional distress. Religious identity was one of the variables associated with lower risk of suicide (OR 0.27). Family connectedness (OR 0.20) and school connectedness (OR 0.12) were both strongly associated with lower suicide risk.	USA C
Tomori 2003	Adolescents; suicide attempts N=4696	To explore the role of sport in relation to self-reported suicide attempts in adolescents.	cross-sectional	The authors established the health attitude to sport activities, frequency of involvement in sport, and involvement in sport as a coping style in distress. Results show that among girls suicide attempts are linked to the attitude that sport is not important for health, and to non-involvement in sport as a coping style in distress. The frequency data provided shows that the boys' suicide attempts were linked to the attitude that sport is not important for health, and to a low frequency of sport activity.	Slovenia C
Tubergen 2005	Catholics, Protestants and non-church going suicide completers N=14744	To critically explore Durkheim's study of suicide to discover the role of religion as a protective factor against suicide: the support provided by religious	cross-sectional	The authors suggest that church participation rates within communities/neighbourhoods will have a direct impact on whether church attendance is protective or not. To explore this, they looked at church participation rates and linked these to suicide completion & church attendance. They found that all suicide rates decrease with rising numbers of a community being church attenders. There was only one exception to this for non-churchgoers where the effect rose above 1 to 1.09 for the period 1936-39. This	Netherlands C

First author & date	Population, relevant outcomes & No. of participants	Objectives	Research design	Main findings	Location & applicability to UK
		networks and/or religion-based moral sanctions on suicide.		contradicts the theory that in areas with high church attendance, the congregation have strong social networks providing social and emotional support which non-churchgoers are excluded from. However, these results show evidence that backs up the community norms theory: that high church attendance means that suicide is strongly prohibited for the whole community rather than only the religious members. The analysis also explored whether suicide rates would be lower according to the most strongly represented denomination. However the analysis showed no difference between denominations, suggesting that the presence of a strong religious community that prohibits suicide is more important in reducing suicide rates than actually being a member of the denomination with the largest congregation. The community norms hypothesis was also tested by linking suicide rates to the overall decline in church attendance over time. Findings suggest that religious communities have a protective effect because of the prohibition on suicide, but with increasing secularisation and the waning of religious participation, community norms related to the religious community have lost impact.	
Van Ness 2002	Older American adults at the end of life; suicide completers Total numbers of studies and participants	To explore the relationship between religiosity /spirituality and mental health in people at the end of life	Systematic review	Durkheim suggested that suicide is less common in countries with greater social integration (whether this be religious or secular), with ecological data reporting suicide rates and religious affiliation. However the review authors state that they were unable to use this data to test the hypothesis that religiosity might predict lower levels of completed suicides. A study that tried to test Durkheim's findings found that the percentage of residents in a region participating in religious organizations is inversely proportional to the rates of suicide in that region. Another study found that religious integration was a significant predictor of lower suicide rates and this was separated from family and political integration. However, another study found that religious involvement and	not stated, USA C

First author & date	Population, relevant outcomes & No. of participants	Objectives	Research design	Main findings	Location & applicability to UK
	not stated			suicide had a non-significant association when measures of social integration were added to the multivariate regression models. Older people and suicide - two studies show that there are higher suicide rates in this age range. A third study of mortality statistics for the 50+ age group controlling for sociodemographic and social contact variables, found that those participating in religious activities were less likely to die by suicide. People who did not participate in religious activities were four times more likely to die from suicide than religious counterparts (who had daily religious activities). Less frequent religious involvement produced intermediate ORs with a generally consistent gradient. However, visiting or talking with friends or relatives did not significantly reduce a person's risk of death by suicide, and so was not a mediator of the association of religious activities with suicide	

ANNEX 12 ADDITIONAL SEARCHES FOR PRIMARY STUDIES OF RISK FACTORS

Search history for primary studies of prisons as a risk factor

1. suicid$.ti,ab,kw.
2. (suicid$ and self-harm).ti,ab,kw.
3. 1 or 2
4. (assisted adj suicide).ti,ab,kw.
5. euthanasia.ti,ab,kw.
6. 4 or 5
7. 3 not 6
8. (risk or (risk adj2 factor$) or (relative adj risk) or (attributable adj risk)).ti,ab,kw.
9. meta?analy$.ti,ab,kw.
10. ((systematic adj1 review$) or (literature adj review)).ti,ab,kw.
11. 9 or 10
12. case report.ti.
13. editorial.pt.
14. letter.pt.
15. 12 or 13 or 14 or 11
16. 7 and 8
17. (prison$ or inmate$ or (young adj offender$)).ti,ab,kw.
18. exp Prisoners/
19. 17 or 18
20. 16 and 19
21. 20 not 15
22. limit 21 to english
23. limit 22 to english language
24. limit 23 to yr="1997 - 2007"
25. remove duplicates from 24

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