

## CRITIQUE

# Studying Survivors of Nearly Lethal Suicide Attempts: An Important Strategy in Suicide Research

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**T**he series of articles in this special issue of *SLTB* from the Centers for Disease Control and Prevention (CDC) study of nearly lethal suicide attempts represents an important contribution to research on suicidal behavior. The investigative approach used is attractive, yet also challenging in terms of research methodology. In this commentary I take the opportunity to highlight certain aspects of this line of research as well as to comment on the specific findings of the CDC study and their relationship to existing knowledge. I also discuss the future potential for this research approach and further questions that might be addressed by it.

### WHY STUDY NEARLY LETHAL SUICIDE ATTEMPTS?

The most important method of studying suicides has for several decades been the psychological autopsy approach, by means of which detailed information on individuals who have died by suicide is collected through official records and inquiry of informants who knew the individual well (Clark & Horton-Deutsch, 1992; Hawton, Appleby, et al., 1998; Shneidman, 1981). This approach has been the basis of many important and informative general studies of suicides in different parts of the world (e.g., Barraclough, Bunch, Nelson, & Sainsbury, 1974; Cheng, 1995; Robins, Murphy, Wilkinson, Gassner, & Kayes, 1959; Vijayakumar & Rajkumar, 1999). It has also been utilized in similar studies of adolescents and young adults (e.g., Appleby, Cooper, & Amos, 1999; Houston, Hawton, & Shepperd,

2001; Brent et al., 1993; Runeson, 1989; Shaffer et al., 1996); elderly people (e.g., Conwell et al., 1996; Harwood, Hawton, Hope, & Jacoby, 2001); and subgroups defined in other ways, for example, by occupation (e.g., Hawton, Simkin, Malmberg, Fagg, & Harriss, 1998). Such studies can be relatively informative about certain characteristics of suicides, including sociodemographic characteristics, methods used for suicide, psychiatric and personality disorders, problems and life events, and contacts with healthcare agencies. This approach has, however, several limitations, including distorted and biased recall of informants and lack of access to information about certain problems, especially those of a more personal nature (Hawton, Appleby et al., 1998).

On the other hand, studying survivors of suicide attempts which were very nearly fatal greatly extends the potential areas that can be

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studied because researchers have access to the living individuals themselves. Thus one can investigate:

- a broader range of contributory or risk factors;
- details of the suicidal process (e.g., cognitive processes that lead up to the decision to try to commit suicide);
- the psychological characteristics of subjects, such as levels of depression and anxiety, hopelessness, self-esteem, impulsivity, aggressive feelings and behavior; and
- biological characteristics, including functioning of neurotransmitter systems, genetic variations, and so forth.

This approach also allows follow-up of patients to investigate persistence or changes in characteristics. Thus trait and state phenomena can be distinguished. It also allows one to study response to treatments, occurrence of further suicidal behavior and the circumstances and psychological process associated with it. This type of investigation provides a potentially very powerful means of developing our knowledge of the suicidal process (Van Heeringen, 2001) and hence of potentially effective treatment and preventive strategies.

#### **How Similar Are Serious Suicide Attempters And Suicides?**

The principle underlying this research strategy is the opportunity to study individuals who, through having come very close to suicide, share the characteristics of actual suicides, or are at least as similar to them as possible. Beautrais (2001) has recently reported the findings of a comparative study of young serious suicide attempters with young suicides in New Zealand. The distributions of many characteristics were very similar in the two samples. This applied to mood disorders, previous suicide attempts, prior outpatient and recent inpatient psychiatric treatment, low income, lack of formal educational qualifications, exposure to recent stressful events, and legal and work-related life events. The suicides were, however, more likely to be male, which may reflect male preference for violent

and hence more dangerous and likely-to-be-fatal methods of suicidal behavior. They also tended to be somewhat older and were more likely to have a diagnosis of non-affective psychosis. On the other hand, the serious suicide attempters were more likely to have a diagnosis of anxiety disorder and to be socially isolated. Further comparative studies are required. They should take account of whether the criteria used to define a group of serious suicide attempters (see below) are an important influence on how similar the suicide attempters are to suicides.

#### **Definition of Serious Suicide Attempts**

An important question is how best to identify serious suicide attempters for studies of this kind. The approach chosen by the investigators in the CDC study was to rely on the physical danger and consequences of the suicidal acts (see Kresnow et al., this supplement), using the Self-inflicted Injury Severity Form (Potter et al., 1998). A broadly similar approach was used by Beautrais, Joyce, and Mulder (1996) in their study of young serious suicide attempters in New Zealand.

This approach, however, fails to take account of suicidal intent; that is, how much an individual may have wanted to die at the time of the act (Beck, Schuyler, & Herman, 1986). This is important because the physical outcome of an act of deliberate self-poisoning or self-injury may be greatly influenced by the means or methods that were available, and not necessarily correlate closely with intent. To take an extreme example, if the most readily available means is a firearm or dangerous chemical substance, the outcome is likely to be fatal or near-fatal, although a substantial proportion of survivors of very serious attempts report having acted very impulsively, as found in the CDC study (see Simon et al., this supplement). On the other hand, the danger of, for example, an overdose of medication may, because of ignorance of what is and what is not dangerous, bear little relation to suicidal intent (Beck, Beck, & Kovacs, 1975). Whether a person who takes an overdose of an antidepressant uses an SSRI, with consequent little danger of serious harm, or a tricyclic, with a

far higher risk of death or of at least the necessity of intensive hospital care (e.g., cardiac monitoring), is likely to depend entirely on what they have been prescribed rather than intent influencing selection according to perceived danger. Then the person's degree of suicidal intent associated with the act would arguably be a better measure of how close in characteristics they might be to an actual suicide, rather than the physical consequences of the act. It could be thus argued that suicidal intent as well as physical danger should be used to define the group of subjects most closely related to suicides.

Given that this type of research investigation is likely to become increasingly important and influential there is perhaps a need for an agreed definition that can be applied across studies and in different countries so as to ensure similarity of methodological approach and hence comparability of research findings.

### Choice of Control Groups

The types of control groups which are chosen for research on dangerous suicide attempts is another extremely important consideration. The major determinant will be the nature of the exposure or risk factors that are being investigated. Thus, as in the CDC study, where researchers want to identify general risk factors, general population controls are required; and where the aim is to determine what factors influence the danger of an act of self-harm, then individuals who have carried out less dangerous acts of self-poisoning or self-injury are needed as controls. On the other hand, where the aim is to examine risk and protective factors for suicidal behavior in the presence of depressive disorders—which are found in the majority of suicide attempters (Haw, Hawton, Houston, & Townsend, 2001)—then depressed individuals who made serious suicide attempts will need to be compared with depressed individuals who do not have a history of suicidal behavior. This may seem obvious, yet control groups are often chosen inappropriately. The above examples also illustrate how studies that aim to answer multiple questions are likely to be rather large, perhaps necessitating multicentre collaborative investigations.

### THE CDC STUDY

There is no doubt that the CDC study is an important step forward in this field, in keeping with the similar initiative of Beautrais and colleagues (1996) in New Zealand. It is characterized by very careful and detailed examination of specific factors, using sophisticated statistical procedures. The researchers have examined a relevant range of variables, although, as is often the case with ground-breaking research, perhaps more questions are posed than answered by the findings.

The decision to focus on younger individuals (under 35 years) is reasonable given the specific issues regarding suicide in the young, especially the rising rates seen in many countries (Cantor, 2000), and the relative paucity of information about risk factors for suicide in this age group. It is, nevertheless, important to remind ourselves that the findings cannot be generalized to older age groups, and that there may be differences even within the younger age group. Thus, for example, the social and clinical factors contributing to suicide in teenagers are likely to show differences from those relevant to suicide in people in their early thirties.

The overall size of the group of nearly lethal attempters ( $n = 153$ ) is reasonable, although when subgroups are examined the power of the study seems less impressive. The group of less lethal attempters is rather small ( $n = 47$ ) and there is rather limited statistical power where comparisons are made between the two groups. Having been involved in similar studies of suicide attempters, this commentator recognizes that obtaining large samples of appropriate subjects can present a formidable task.

The size and method of recruitment of the group of general population controls seem very reasonable. There is, however, as in many case-control studies using the psychological autopsy approach, the difficult issue that the rate of refusal and failure to respond is high and one does not know what bias this might introduce. For example, are individuals with psychiatric disorders more or less likely to agree to participate? This issue presents a sig-

nificant challenge for this kind of research investigation.

The CDC study is cross-sectional, in the sense that subjects were only interviewed at one point in time. Because of this, the authors may have missed an important opportunity to examine, for example, whether certain characteristics (e.g., alcohol consumption) persisted, the risk and nature of repeat episodes of self-harm, plus the patients' responses to treatment. As noted above, a great strength of this type of study is the ability to study subjects over time rather than just on the basis of information gathered at one time-point.

One cannot but agree with the authors' assertion of the need to look beyond mental illness in investigating risk and predictive factors related to suicidal behavior. We now have extensive knowledge of the extent and nature of psychiatric disorders in completed suicides. The pressing questions are what other factors increase suicide risk, in the presence (or absence) of psychiatric disorders, and what factors can protect against or help reduce such risk. Recently there have been some other informative studies of young people that have begun to address these questions (Appleby et al., 1999; Beautrais et al., 1996; Brent et al., 1993; Gould, Fisher, Parides, Flory, & Shaffer, 1996).

#### **Factors Associated With The Medical Severity Of Suicide Attempts**

Some of the findings from the CDC study regarding factors that distinguish near-fatal suicide attempts from those of lesser lethality (Swahn & Potter, this supplement) are perplexing. The association of prior suicide attempts with less lethal suicide attempts is not unexpected and in keeping with the results of a previous study (Elliott, Pages, Russo, Wilson, & Roy-Byrne, 1996). Within the repeater group will be patients who make several attempts of relatively low lethality, probably because the behavior serves a purpose other than trying to achieve death (Bancroft et al., 1979; Bancroft, Skrimshire, & Simkin, 1976).

It is the association of greater depressed mood and hopelessness with less lethal suicide attempts rather than with near-fatal attempts

that is surprising, especially as the opposite result with regard to depression was found in an earlier investigation (Elliott et al., 1996). Also, level of hopelessness has been shown to predict future suicide, although this finding was based on measurement of hopelessness often long before deaths occurred (Beck, Steer, Kovacs, & Garrison, 1985). The explanation given by the authors for this finding, namely that suicide attempters with higher levels of depression and hopelessness may have impaired ability to plan and carry out a suicide, seems inherently unlikely. While it is true that depression impairs problem-solving ability (Marx, Williams, & Claridge, 1992), the large weight of evidence linking actual suicide with depression and hopelessness strongly suggests that the associations should be in the other direction; i.e., an association between more dangerous suicide attempts and depression and hopelessness. One wonders if the relatively small size and method of selection (inclusion irrespective of medical severity) of the control group of attempted suicide patients, plus the relatively low participation rate, could have contributed to this finding.

In terms of prevention of near-lethal suicidal behavior, and, by extrapolation, completed suicide, the finding regarding previous suicide attempts is perhaps the most pertinent. One major element in most suicide prevention policies is improved management of suicide attempters. While the frequency of prior suicide attempts in the near-lethal suicide attempter group (47.4%) means that this is important, the fact that more than half the individuals in this group had not made prior attempts means that preventive efforts must also be targeted at earlier stages in the suicidal process, as well as at reducing availability of dangerous means for suicide (Clarke & Lester, 1989).

#### **Alcohol Consumption**

In the CDC study, alcohol consumption and abuse have been examined in considerable detail, with a focus on three areas—alcohol dependency, usual drinking patterns, and drinking immediately prior to the suicide at-

tempt (Powell et al., this supplement). The findings confirm the importance of alcohol dependency as a risk factor for suicidal behavior (Murphy, 2000). As the authors have noted, the very high odds ratio associated with drinking in the 3 hours before the suicidal act compared with drinking over a similar time period in controls tells us little about the actual role of alcohol use in the suicidal process, especially as there was no matching for immediate life events in the controls. More detailed inquiry of the suicide attempters regarding how they, in retrospect, perceived the role of their alcohol consumption immediately preceding the attempts could have been informative. Such inquiry might, for example, have established the extent of importance of the potentially disinhibiting effect of alcohol in relation to suicidal impulses, or the extent to which drinking contributed to or compounded the individuals' life problems.

### Geographical Mobility

The association between geographical mobility, a known risk factor for suicidal behavior, and risk of a near-lethal suicide attempt has been studied in a particularly elegant way in the CDC study (Potter, et al., this supplement), with careful control for certain potential confounding factors, namely gender, depression, and alcohol dependency. The dose-response associations of increasing risk with increases in the number of moves, distance moved, and difficulty of staying in touch with friends and family, strongly supports a specific contribution of geographic mobility and social isolation to risk of serious suicide attempts. The number of moves in the 12 months before the suicide attempts emerged as the key mobility variable associated with risk. As the authors themselves point out, one is left wondering about the reasons for the frequent moves in the suicide attempter group—e.g., rejection by others, wish to avoid becoming integrated in social networks, seeking hoped-for new opportunities, etc.—and also the effect of the moves on the individuals. This is another example of where following up the highly structured questions with some more qualitative inquiry may have been highly informative.

### Impulsive Suicide Attempts

One cannot dispute that the cut-off point for impulsive suicide attempts in the CDC study of less than 5 minutes between making the decision to attempt suicide and carrying out the actual act represents extreme impulsivity (Simon et al., this issue). The findings that more impulsive suicide attempts were associated with male sex and a history of fighting is unsurprising given the link between impulsivity and aggression (Plutchik & van Praag, 1995). Inclusion of a more general measure of impulsivity than the three questions which were asked (fighting, quitting job, multiple sex partners) would have allowed the potential association of impulsivity with nature of suicide attempt to have been investigated further. The absence of an association of impulsive attempts with alcohol consumption beforehand is perhaps surprising given the well-recognized disinhibiting effects of alcohol.

Perhaps the most important implication of a highly impulsive suicide attempt is that it is most likely to involve a method of suicidal behavior that is immediately to hand. This is the situation in which a policy of limiting availability of dangerous means for suicidal actions is most likely to be effective. It has clear relevance to limiting availability of means such as firearms, dangerous medicines, and toxic substances such as pesticides and insecticides.

### Medical Conditions

The association of nearly lethal suicide attempts with serious medical conditions, discussed by Ikeda et al. (this issue), is not surprising in light of extensive findings linking many medical conditions with risk of suicide (Stenager & Stenager, 2000). In the CDC study the association was only statistically significant in males, but this may have reflected the limited power of the study in this regard given the relatively low prevalence of serious medical conditions.

The finding of an association of suicide attempts with HIV positive status is in keeping with previous work (Catalan, 2000) and, as the authors point out, highlights the need to investigate other specific disease associations



in this population. However, the design used in this study might not be the best for this purpose given the vast numbers of subjects which would be required. Record-linkage studies in which large epidemiological datasets of people with known illnesses studied in parallel with similar large suicide attempter datasets would offer the best means of studying the potential associations. More detailed inquiry of series of patients with specific medical conditions who have made suicide attempts would then help elucidate what aspects of the conditions lead to suicidal thinking and behavior.

### Help-Seeking Prior To Nearly Lethal Suicide Attempts

Another perplexing finding to emerge from the CDC study is the *lower* proportion of cases seeking help from consultants or any professional helpers in the near-lethal suicide attempt group in the month before the attempts compared with the month before interview in the general population control group (Barnes, Ikeda, & Kresnow, this issue). This is particularly difficult to understand given the findings of several studies which indicate relatively high rates of contact with medical agencies in the period before both suicide and suicide attempts in younger as well as in older individuals (Pirkis & Burgess, 1998), identification of contact with a general practitioner as an independent risk factor for suicide after adjustment for Axis I psychiatric disorder in a case-general population control study of suicides in Northern Ireland (Foster, Gillespie, McClelland, & Patterson, 1999), and the found crescendo increase in such contacts in the weeks leading up to youth suicide (Appleby, Amos, Doyle, Tomenson, & Woodman, 1996; Hawton, Houston, & Shepperd, 1999). It is important to note that help was more often sought from family and friends than from professionals in the serious suicide attempter group in the CDC study, a finding that the authors point out highlights the need for greater public education about mental health problems and suicide.

Caution is needed in interpreting the finding that when the suicide attempters did seek help in the month before their attempts, nearly half

discussed their suicidal ideas. While this does indicate that these individuals were declaring themselves at risk it is important to be reminded that clinicians see many patients who express suicidal ideas to one degree or another, only a small minority of whom carry out subsequent suicidal acts. While expression of suicidal ideas is a warning sign one cannot assume with benefit of hindsight that the clinicians necessarily always acted inappropriately or inadequately in the care of individuals in the CDC study.

### THE CDC STUDY IN CONTEXT

As already noted, the CDC study is similar in several respects to the equally impressive study of young survivors of physically serious suicide attempts conducted by Beautrais and colleagues (1996; 2001) in New Zealand. Where does it stand in relation to other major studies of suicide attempters? The largest such study is the WHO/EURO Multicentre Study of Suicidal Behaviour, in which many centers in Europe are collaborating (Kerkhof, Schmidtke, Bille-Brahe, De Leo, & Lönnqvist, 1994; Schmidtke, Bille-Brahe, De Leo, & Kerkhof, 2001). This study is in two parts. The first involves ongoing monitoring of all presentations to general hospitals and, in some centers, other clinical facilities, because of deliberate self-poisoning or self-injury. The monitoring part of the project began in 1989, although as time has gone on some new centers have joined the project and some of the original centers have left it. This part of the project has provided valuable comparative data on patterns of 'parasuicide' in different European countries (Platt et al., 1992; Schmidtke et al., 1996, 2001), as well as trends over time.

The second part of the WHO/EURO study is an in-depth investigation of a representative series of patients in almost every center, with a one-year follow up using the European Parasuicide Interview Schedules (EPSIS) (Kerkhof, Bernasco, Bille-Brahe, Platt, & Schmidtke, 1989). This has provided the opportunity for cross-cultural comparisons of many aspects of the behavior (e.g., motives, types of problem, temporal patterns), as well

as information relevant to increasing local knowledge of deliberate self-poisoning and self-injury in each center.

The WHO/EURO study clearly differs from the CDC study. In addition to including ongoing monitoring of self-harming behavior, the WHO/EURO study includes in the detailed EPSIS study unselected patients who present with deliberate self-poisoning or self-injury, except for those whose self-harming behavior is characterized by repetitive self-mutilation (Platt et al, 1992). Thus, while individuals with highly dangerous and physically life-threatening suicide attempts are included, the majority of subjects would have engaged in acts of lesser severity and/or suicidal intent. Their inclusion is because of an intended focus on representative patients from the deliberate self-harm or "parasuicide" population. Interestingly, this difference may reflect a general, more marked concern with deliberate self-harm in Europe, with perhaps a greater focus on completed suicide in the US. The literature in this field over the past three or four decades would support this notion. Within the European study, however, it is possible to distinguish patients with more dangerous acts of self-harm, or greater suicidal intent, from those who engaged in less severe acts, and so comparative studies of the kind included within the CDC study are feasible. But as there is no requirement in the European study to include a sample of general population controls, assessment of risk factors in the way that has been done so effectively in the CDC study is not possible.

### **The Need for Further Studies**

As indicated earlier, I believe that investigating survivors of serious suicide attempts should become a key future research strategy in the study of suicidal behavior. The range of factors that can be investigated is so much broader than when using the psychological autopsy approach to study suicides. The possibility of longitudinal investigation as well as the opportunity to study psychological and biological processes more fully adds greatly to the potential information that can be acquired by this approach.

The elegant methodology and careful analysis involved in the CDC study suggests that this group of investigators should be among the leaders of this line of research. The results of this study have been very informative, mainly in strongly confirming some earlier findings and in challenging others. Future investigations using this approach must build on it and others such as those of Beautrais and colleagues (1996). There is, in my opinion, an urgent need to reach consensus on what types of acts and intent should be incorporated in an international definition of serious suicide attempts that will allow international comparisons and also pooling of data from different studies.

Elegant epidemiological analyses, as in the CDC study, need to be accompanied by more qualitative inquiry which will help explain the hard statistical findings and avoid researchers succumbing to the ecological fallacy in which associations are falsely interpreted as causal (Greenland & Morgenstern, 1989). From the results of the CDC study it is clear, for example, that we need to elucidate how alcohol consumption adds to suicide risk, the ways in which specific medical illnesses may lead to suicidal behavior, the reasons for high geographical mobility and the nature of its impact on suicidal individuals, what factors contribute to individuals carrying out impulsive suicide attempts, the patients' interpretations of how clinicians and others respond to their experience of suicidal ideas, and the relative contributions of availability of means and suicidal intent in determining the choice of dangerous methods of suicidal behavior. It is important that sophisticated measures of psychological characteristics such as impulsivity, aggression, problem-solving ability, and self-esteem are included in future investigations, as well as those which measure depression and hopelessness. Finally, while the CDC study researchers are correct in their assertion of the need to look beyond mental illness, assessment of psychiatric and personality disorders should be incorporated in future studies, not least so that they can be controlled for in investigations of other contributory factors.

In conclusion, the authors of the CDC study are to be congratulated on the fine investigation that has resulted in the original publications in this special issue of *SLTB*. It should serve as a prompt for others to engage in this type of research. Further rigorous investigations of this kind are likely to considerably

advance knowledge of fatal and non-fatal suicidal behaviors, which can only help improve our ability to prevent suicide and to more effectively treat those at risk.

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