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Editorial

Suicide: Risk Factors and the Public Health

Approximately 30 000 Americans commit suicide each year.[1] The public health significance of death by suicide has been emphasized by the recent establishment of the National Center for Injury Prevention and Control at the Centers for Disease Control. A principal goal of the new Center is the identification of effective suicide prevention methods.

What do we know about the causes of suicide? Because of its relatively low incidence and because many people who commit suicide die without having had prior contact with treatment services, the most feasible and commonly used suicide-research design has been a case-control study in which retrospective inquiries are made about abnormal behaviors or symptoms present before death—the "psychological autopsy" technique. Although inevitably open to incomplete information and retrospective distortion, studies of this kind indicate that a substantial majority of suicide victims would likely have met criteria for some form of psychiatric disorder.

The most common of such presuicide diagnoses are alcohol abuse, depression, an anxiety disorder, and aggressive behavior.[2,3,4] Alcohol abuse seems especially important. In one study of adults, alcohol abuse was second only to depression as a risk factor for suicide[2]; in a study of adolescents, approximately two thirds of 17- to 19-year-old male suicides were reported to drink excessively.[4] Psychological autopsies have been complemented by a number of small-scale biological autopsies that have consistently identified systematic differences between suicides and control subjects in their markers of central nervous system serotonin function. Similar differences have been observed between highly aggressive and impulsive individuals and control subjects.

Research by sociologists and others has superimposed suicide mortality on population or economic trends.[5] These comparisons have been interpreted as indicating a link between suicide and such social ills as unemployment or population pressures on educational or occupational resources. This view rests on data open to the ecological fallacy and is not broadly supported by the known epidemiology of suicide. In the United States, the large differences in the suicide rate between different ethnic groups offer little support to the social pressure/disadvantage hypothesis (e.g., suicide is generally *less* common among African Americans). Furthermore, after controlling for ethnicity in a study of a consecutive series of adolescent suicides, researchers found few socioeconomic differences that would have supported a social-disadvantage hypothesis.[6] However, it is likely that socioenvironmental factors are playing at least some part in the suicide story, for there has been a marked increase in the suicide rate over the past 30 years, mainly among males under age 30.

Finding explanations for suicide has never been the sole prerogative of the scientist. The currently popular book *Final Exit*[7] (which includes a collection of "how to do it" recipes for would-be suicides) presupposes that, often, reasonable and rational individuals who are facing a medically hopeless situation would commit suicide if they or their friends or relatives knew how. Although this position sounds reasonable, and although rates of suicide are elevated among the physically ill, there is little evidence that suicide in the seriously ill occurs without accompanying de-

Editor's Note. See related articles by Garrison et al. (p 179) and Hemenway et al. (p 249) in this issue.

pression or other abnormal mental states.[8] The will to live against all odds seems to be part of the human condition; a departure from that state is nearly always associated with acute psychological distress that can be expected to respond well to modern treatment methods. Finally, the lay public and special interest groups of all political hues regularly point to the prevalence of suicide or to individual case reports to support their particular cause, whether it be opposition to heavy metal music or the fantasy game "Dungeons and Dragons" or support for more effective gun control or for greater tolerance for gays. No matter how much merit these positions may have, their claims about the role of suicide are rarely well established.

This issue of the Journal includes two methodologically sophisticated papers that add materially to our knowledge about risk for suicide.[9,10] Where they examine similar variables, they identify consistent risk factors in two very different groups: predominantly White middle-aged professional women, and 3764 teenagers of mixed ethnicity and sex who have attempted or thought about suicide. Reporting on one of the very few prospective longitudinal studies to have related contemporaneously collected information to subsequent suicide, Hemenway and colleagues describe a dose-response relationship between the amount of cigarette smoking and subsequent death from suicide in a large population of predominantly white middle-aged nurses. Garrison and her colleagues find a robust relationship between various forms of suicidal ideation and behavior and cigarette smoking, aggression, and alcohol and substance abuse in teenagers.

How do these findings fit with other research? First, it seems highly unlikely that smoking plays a direct causal role in suicide. Hemenway et al. suggest three possible mechanisms: (1) suicide's relationship to smoking may be a direct consequence of tobacco-related malignant disease; (2) depression is a common suicide antecedent that may lead to smoking as a form of self medication and separately to suicide; or (3) smoking is a marker for some other feature of psychopathology. Garrison and colleagues' findings of a relationship between smoking and suicidal ideation and attempts in a much younger population make the first explanation improbable. It appears that the relationship between smoking and suicidal behavior is present well before the age of risk for tobacco-related malignant disease. In light of the known relationship between smoking and alcohol and the psychological autopsy studies that point to a strong relationship between alcohol intake and suicide, it seems most likely that smoking is a marker for alcohol as an important third variable. One hopes that this relationship will be explored further in subsequent analyses of Garrison et al.'s rich data set. It is remarkable and regrettable that, despite the existence of many large prospectively studied cohorts, suicide outcome is so rarely addressed.

Garrison and colleagues' research examines the risk factors and characteristics of suicidal ideation and behavior in a general South Carolina adolescent population. In many respects this breaks new ground, because the emphasis in the few previous population-based surveys has been on prevalence, and the bulk of risk-factor research on attempted and ideational suicide in teens has been drawn from almost certainly unrepresentative referred populations. There are striking differences between the population identified in this survey and what is known of the epidemiology of completed suicide. Completed suicides are predominantly male, and the male-female ratio during adolescence approaches 5:1. In Garrison and colleagues' population, suicidal ideation and behavior was more common among females, although the female excess of between one-and-a-half to two times the frequency among males is less than is commonly reported in referred populations.

Garrison et al.'s finding of a relationship between suicide and alcohol intake and aggressive behavior is compatible with studies of completed suicide. However, in such studies the relationship between suicide and alcohol and substance use has held most strongly for males, and it will be important to see whether there are similar sex differences in the relationships in the South Carolina sample. The finding of alcohol abuse as a risk factor for suicide in males but not females has been used to explain the secular increase of suicide, a trend that has been largely a male phenomenon.

Although Garrison et al.'s study did not assess the subjects for depression, the robust relationship between suicidal behavior and aggression suggests that suicide prevention programs that confine their case-finding or therapeutic activities to depression may miss their target. This study and studies of completed suicide indicate that the most appropriate suicide prevention strategies for adolescents may be finding and treating not only depressed teenagers but also aggressive adolescents and adolescents with patterns of excessive alcohol use. □

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