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THE EPIDEMIOLOGY OF POST- TRAUMATIC STRESS DISORDER: SOME COMMENTS AND CONCERNS

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Studies of the prevalence of post-traumatic stress disorder have appeared in the research literature with increasing frequency over the past ten years. These studies, while focusing often on the prevalence of PTSD in combat (e.g., Kulka et al., 1990), have also examined the rate of this disorder in the general population (Helzer et al., 1987), among survivors of a natural disaster (e.g., Mt. St. Helens; Shore et al., 1986), a technological disaster (e.g., Buffalo Creek; Gleser et al., 1981), and criminal victimization (e.g., Kilpatrick et al., 1985). In each study persistent mental health disturbance has been found among some of the people who have endured an extreme life experience. The purpose of this article on epidemiology is to provide a conceptual framework for understanding the findings on the prevalence of PTSD and to comment on some of the shortcomings of research in this area.

Inspection of the findings of studies quickly reveals that there are wide variations in estimates of PTSD both from the same event and across events. While the latter finding is not completely surprising, the former one is. The resolution of such disparate results can be found generally in the different ways in which researchers framed their study questions and how they proceeded to collect their data. Importantly, only a few studies actually collected data on PTSD per se; many studies examined psychological distress more generally. Even fewer studies employed multiple measures of PTSD, preferring to rely exclusively on a single diagnostic measure. This procedure for case identification suffers from many obvious shortcomings, centering on the imperfection of any single measure of a psychological disorder. Other limitations of epidemiological work will be discussed more fully below.

Objectives of Epidemiological Studies. Probably the most compelling objective for an epidemiological study is to determine the rates of specific disorders so that society can properly analyze the parameters of a problem, establish an effective public policy regarding it, and, in the case of mental health disorders, provide the mechanisms for funding scientific study and the clinical services needed to treat disorders.

A second objective of epidemiological studies

is to understand further the many factors that influence proper functioning in our society and culture. As our lives become increasingly affected by shifting technological and societal advances, we need to study comprehensively the consequences of the changes so that decisions regarding the direction in which our society heads are made in an informed manner and based upon scientific evidence.

Third, epidemiological studies help us to understand more fully how our society and culture function, giving us normative information about the presence and absence of certain problems. The range of issues examined can be health, mental health, opinions, occupation, habits, personal characteristics, etc. Data on these variables commonly appear in our scientific literature, but also appear regularly in the mass media. Studies on health and behavior, and the consequences of life experiences, are inherently interesting to members of Western societies. Epidemiological studies provide this information and thereby afford us the opportunity to better understand ourselves and others, while providing the justification for societal action on specific issues.

Studying the Epidemiology of Psychological Problems. In the field of mental health, epidemiological study has suffered from a variety of problems. First among these is the absence of agreement on reliable and valid measurement instruments for our diagnostic categories. This problem is premised on the lack of a gold standard for any of the mental health disorders and the difficulty in measuring the constructs that have been defined (e.g., schizophrenia, depression, PTSD). The gold standard problem is further compounded by changing criteria for some diagnoses with new scientific findings, fresh perspectives, and new editions of the *Diagnostic and Statistical Manual (DSM)*.

A second problem in mental health epidemiology has been the expense associated with labor-intensive interviews that often last hours and generate thousands of data points. Analyses and interpre-

It has come to our attention that a number of our readers have collected their own bibliographies and bibliographic databases on PTSD and a variety of issues relating to traumatic stress. We encourage those of you who have developed such bibliographic information to share it with us for inclusion in our database, PILOTS. If you choose to do so, you will be making an important contribution to our efforts to bring the world's PTSD literature to the international community of scholars who will be accessing PILOTS through the BRS system.



tation of these data can be a daunting task fraught with the possibility of error. Related to this problem is the reliance exclusively on self-report measures of symptomatology. In other medical subspecialties, the criteria for case identification involve numerous biological tests that are less affected by potential for bias.

Despite some of these concerns, a number of important advances have been made in the epidemiology of mental health disorders. Methodology proposed by Bruce Dohrenwend and his colleagues (e.g., Dohrenwend & ShROUT, 1981), known as the multimethod approach to case identification, involves casting a very broad net in the earliest stages of interviewing and trying to identify possible cases in a cost-efficient manner. In a second stage, more complex assessment procedures are applied, typically including diagnostic interviews by established clinicians to determine which of the earlier identified subjects are indeed cases.

This approach was applied in the most methodologically rigorous epidemiological study of psychological problems ever conducted in the United States. Kulka et al. (1990) employed a two-stage case identification process in their classic study of PTSD in Vietnam veterans. From interviews conducted by trained lay interviewers, they used data to select those who would then be interviewed again by experienced mental health clinicians. In confirming case identification, these authors used multiple measures of PTSD — standardized interviews and psychological tests — to determine the probability of any individual having PTSD. Given the lack of a gold standard and the accepted problems in measuring a psychological construct, such as PTSD, this approach was sound and will undoubtedly influence future epidemiological studies of psychological disorders.

Prevalence of PTSD. In the Kulka et al. (1990) study, the prevalence of current PTSD for Vietnam veterans was 15% among all veterans, 21% among Blacks, and 28% among Hispanics. Nearly 9% of women veterans had PTSD. Lifetime rates were essentially twice that of the current rates. These findings have resulted in strong action by both the Department of Veterans Affairs and the U.S. Congress. By establishing multiple programs for outreach and treatment of Vietnam veterans in the Veterans Administration Medical Centers and Outpatient Clinics across the country, these recent initiatives have yielded enhanced care for the men and women who served in Vietnam. At a time when resources are dwindling for public sector care, it is indeed impressive that the DVA's comprehensive approach to treatment of the Vietnam veteran has been so widely accepted. The PTSD Clinical Teams, the Substance Abuse - PTSD treatment programs, and Specialized Inpatient PTSD and Substance Abuse programs all complement the existing Vet Center program and previously developed PTSD treatment resources. These programs ensure that veterans needing treatment for the psychological consequences of war can receive that care across the U.S.

Other prevalence estimates of PTSD in Vietnam com-

bat veterans have varied from study to study. The Legacies Study (Egendorf et al., 1981) found 16-24% of their subjects suffering significant psychological distress, while the Centers for Disease Control (1988) found a current rate of 2.2% with a lifetime rate of 15%. Each study employed limited sampling and measurement procedures and for these reasons is probably less accurate in its estimates than the National Vietnam Veterans Readjustment Study (NVVRS). Card (1987) employed a creative strategy in surveying the members of Project Talent 14 and 21 years after their 9th grade evaluations. This longitudinal (and in some ways prospective) study found that 19% of Vietnam veterans had PTSD at age 36. The Helzer et al. (1987) study found a less than 5% rate of PTSD among Vietnam veterans, while Stellman et al.'s (1988) study of American Legion volunteers found lifetime rates of PTSD from 1.8% to 15%, depending on the stringency of the definition of PTSD employed with their questionnaire data. Clearly, the many methodological differences between the NVVRS and other studies make comparisons difficult, but the sampling methods and assessment model employed in NVVRS merit high priority when drawing conclusions regarding the effects of the Vietnam War on its participants.

PTSD can also occur following a range of other stressful, life-threatening experiences. Kilpatrick and his colleagues (1985) studied the effects of criminal victimization on a random sample of women in Charleston County, South Carolina. They found that sexual assault victims expressed greater emotional distress on all psychological variables than nonvictims. Victims of aggravated assault and attempted robbery also differed from nonvictims in the presence of serious mental health problems.

Following the eruption of the Mt. St. Helens volcano, Shore et al. (1986) evaluated the presence of post-disaster psychological disorders in three groups stratified according to stress exposure. Among those who were exposed to extreme stress, 40% reported major psychological disturbance some three to four years following the disaster. Similarly, McFarlane (1986) followed firefighters who were involved in extinguishing the Ash Wednesday bushfires in South Australia and found that 21% of these people had PTSD symptomatology 29 months after the event and that little change had occurred longitudinally in these symptoms.

Studying the aftermath of surviving the Beverly Hills Supper Club fire in Kentucky, Green and her colleagues (1983) in an elegant sequence of studies not only found high rates of psychological morbidity, but also established important conceptual links among pre-existing traits, components of the stressor, and the post-trauma environment in identifying people who were at greatest risk for long-term impairment.

Other studies included in this review are preliminary attempts to identify and alert clinicians and researchers to the psychological problems of specific populations, although the projects are limited by a variety of methodological problems. The studies are important to the field in that they set the stage for future rigorous studies, but most

importantly they bring attention to the presence of a societally important problem (e.g., Mollica et al., 1987; Craine et al., 1988).

It is difficult to determine with any assurance the precise rate of non-combat-related PTSD. Few studies have been able, for obvious reasons, to study random samples of subjects exposed to various forms of disaster or extreme life stress. Fewer still were able to estimate prevalence rates for society as a whole as a function of the number of similar events nationwide. In trying to integrate the exact information on the epidemiology of PTSD, perhaps the most challenging task was to interpret sensibly the outcomes of studies that used very different subjects, stressors, dependent measures, sampling strategies, independent variables, and data analytic procedures.

The rates of PTSD in the general population at this time are unknown. With high rates of rape (Nadelson et al., 1982), criminal victimization (Kilpatrick et al., 1985), natural disaster (McFarlane, 1986), technological disaster (Green et al., 1983), and war (Mollica et al., 1987) all contributing to the development of PTSD in the population, it is likely that the rates of PTSD might reach higher than the 1 to 2% initially indicated by Helzer et al. (1987; see also Keane & Penk, 1988) in their assessment of PTSD in the St. Louis portion of the Epidemiological Catchment Area Survey.

Minimally, the Helzer study yields 2.4 - 4.8 million cases of PTSD in the USA alone. Worldwide estimates of the prevalence of PTSD in the general population might be even greater. In any case, PTSD is an international public health problem.

In drawing conclusions regarding the prevalence of PTSD, it seems clear that many studies are finding that the most vulnerable and disenfranchised people suffer disproportionately as a result of exposure to extreme stressors. However, this does not mean that individuals are invulnerable to the psychological consequences of such life experiences, regardless of their available resources. Once exposed to extreme stressors, all risk the development of psychological impairment; however, it does seem that certain segments of our population may be at greater risk for such exposure.

Reference

- DOHRENWEND, B.D. & SHROUT, P.B. (1981). **Toward the development of a two-stage procedure for case identification and classification in psychiatry epidemiology.** *Research in Community and Mental Health*, 2, 295-323.

SELECTED ABSTRACTS

CARD, J.J. (1987). **Epidemiology of PTSD in a national cohort of Vietnam veterans.** *Journal of Clinical Psychology*, 43, 6-17. At age 36, Vietnam veterans in the high school class of 1963 reported significantly more problems related to nightmares, loss of control over behavior, emotional numbing, withdrawal from the external environment, hyperalertness, anxiety, and depression than did their classmates matched with them on 51 high school characteristics. These problems correspond closely to the disorder labeled PTSD by the American Psychiatric Association. PTSD was associated with other family, mental health, and social interaction problems. Some environmental variables — e.g., the presence of a spouse or being a churchgoer — were associated with reduced levels of PTSD or with reductions in the degree of association between combat and PTSD. The direction of cause and effect in these associations cannot be ascertained from our data, but it seems plausible to postulate that support factors can and do help some Vietnam veterans with PTSD.

CENTERS FOR DISEASE CONTROL (1988). **Health status of Vietnam veterans: I. Psychosocial characteristics.** *Journal of the American Medical Association*, 259, 2701-2707. The Vietnam Experience Study was a multidimensional assessment of the health of Vietnam veterans. From a random sample of enlisted men who entered the US Army from 1965 to 1971, 7,924 Vietnam and 7,364 non-Vietnam veterans participated in a telephone interview; a random subsample of 2,490 Vietnam and 1,972 non-Vietnam veterans also underwent a comprehensive health examination, including a psychological evaluation. At the time of the study, the two groups of veterans were similar in terms of level of

education, employment, income, marital status, and satisfaction with personal relationships. Certain psychological problems, however, were significantly more prevalent among Vietnam veterans than among non-Vietnam veterans. These included depression (4.5% of Vietnam veterans vs 2.3% of non-Vietnam veterans), anxiety (4.9% vs 3.2%), and alcohol abuse or dependence (13.7% vs 9.2%). About 15% of Vietnam veterans experienced combat-related PTSD at some time during or after military service, and 2.2% had the disorder during the month before the examination.

CRAINE, L.S., HENSON, C.E., COLLIVER, J.A. & MACLEAN, D.G. (1988). **Prevalence of a history of sexual abuse among female psychiatric patients in a state hospital system.** *Hospital and Community Psychiatry*, 39, 300-304. Fifty-one percent of a sample of 105 female state hospital patients were found to have been sexually abused as children or adolescents. In the majority of cases, hospital staff were unaware that the patients had histories of sexual abuse, and only 20% of the abused patients believed they had been adequately treated for sexual abuse. Sixty-six percent of the abused patients met the diagnostic criteria for PTSD, although none had received that diagnosis. Compared with patients who had not been sexually abused, abused patients were significantly more likely to have 17 of 32 symptoms commonly linked with sexual abuse. Every patient who was positive for six symptoms — compulsive sexual behavior, chemical dependency, sadomasochistic sexual fantasy, sexual identity issues, chronic fatigue, and loss of interest in sex — had been sexually abused.

EGENDORF, A., KADUSHIN, C., LAUFER, R.S., ROTHBART, G. & SLOAN, L. (1981). **Legacies of Vietnam: comparative adjustment of veterans and their peers.** New York: Center for Policy Research. A random sample of 1,440 men (714 veterans and 626 nonveterans) who served or were eligible to serve in the Vietnam War participated in 3-to-5-hour interviews. Although comparatively few Vietnam veterans (16.6%) believed that the war had a distinctly negative psychological impact on their lives, heavy combat veterans were much more likely to make this assessment (29.6%). The emotional effects of combat differed according to time and place, but the behavioral indicators (arrests, drug and alcohol use) did not vary in this way, nor did medical problems. During the war, and for a period of one year after it, Vietnam veterans were three times as likely to report PTSD symptoms as Vietnam era veterans; Vietnam era veterans were twice as likely to report symptoms as nonveterans. Blacks and Chicanos reported PTSD symptoms more often than whites; being in Vietnam resulted in PTSD symptoms for blacks to the same extent that being in combat produced them for whites. At the time of the survey, more than 33% of Vietnam veterans who were in heavy combat reported PTSD symptoms, compared with less than 20% of the nonveterans and Vietnam era veterans. Almost 70% of black veterans who were in heavy combat reported PTSD symptoms; 40% of black Vietnam veterans as compared with 20% of white Vietnam veterans reported PTSD symptoms in the survey. [FAL]

GLESER, G.C., GREEN, B.L. & WINGET, C. (1981). **Prolonged psychosocial effects of disaster: A study of Buffalo Creek.** New York: Academic Press. The authors studied psychiatric interview and questionnaire data obtained from survivors of the Buffalo Creek Flood of 1972 who were suing the mining company responsible for the flood. Even two years after the flood, only one in six adult victims was asymptomatic and 35% were still moderately to severely disturbed. Over 30% of victims who were followed up to five years continued to experience serious symptoms. Demographic characteristics such as sex, race, age, and education were related to symptomatology in both independent and interactive patterns. The authors suggest six factors that affect an individual's response to a disaster: threat to life in self and significant others; bereavement; amount of physical suffering and lack of normal necessities; displacement of living environment; proportion of community or group affected; and cause of disaster. [PPS]

GREEN, B.L., GRACE, M.C., LINDY, J.D., TITCHENER, J.L. & LINDY, J.G. (1983). **Levels of functional impairment following a civilian disaster: The Beverly Hills Supper Club fire.** *Journal of Consulting and Clinical Psychology*, 51, 573-580. The present study reports on levels of psychological functioning of survivors of the Beverly Hills Supper Club fire. Subjects (n = 117) who were at the fire and 30 subjects who were not at the fire (bereaved families, rescue workers) were assessed regarding objective stressfulness of their fire experience, subjective stressfulness, and intensity of psychological symptoms (using the Psychiatric Evaluation Form) in a structured clinical interview approximately 1 year after the fire. They also filled out the Symptom Checklist-90, Revised Version (SCL-90R). Eighty-eight subjects were followed up at 2 years. The group as a whole was more impaired than comparison samples of normals but less impaired than outpatients. Subjects at the fire were less impaired than those not at the fire, who were similar to outpatients on the PEF. The latter group improved significantly on several measures from 1 to 2 years postfire, whereas the group at the fire showed little change. The results are discussed in the context of the specific instruments and

methodology used in the present study, impairment levels of other samples, and the nature of the particular disaster.

HELZER, J.E., ROBINS, L.N. & MCEVOY, L. (1987). **Post-traumatic stress disorder in the general population: Findings of the epidemiologic catchment area survey.** *New England Journal of Medicine*, 317, 1630-1634. There have been numerous studies of PTSD in trauma victims, war veterans, and residents of communities exposed to disaster. Epidemiologic studies of this syndrome in the general population are rare but add an important perspective to our understanding of it. We report findings on the epidemiology of PTSD in 2,493 participants examined as part of a nationwide general-population survey of psychiatric disorders. The prevalence of a history of PTSD was 1% in the total population, about 3.5% in civilians exposed to physical attack and in Vietnam veterans who were not wounded, and 20% in veterans wounded in Vietnam. PTSD was associated with a variety of other adult psychiatric disorders. Behavioral problems before the age of 15 predicted adult exposure to physical attack and (among Vietnam veterans) to combat, as well as the development of PTSD among those so exposed. Although some symptoms of PTSD, such as hyperalertness and sleep disturbances, occurred commonly in the general population, the full syndrome as defined by the *Diagnostic and Statistical Manual of Mental Disorders*, third edition, was common only among veterans wounded in Vietnam. (For comment, see KEANE, T.M. & PENK, W.E. (1988). **The prevalence of post-traumatic stress disorder** [letter]. *New England Journal of Medicine*, 318, 1690-1691.)

KILPATRICK, D.G., BEST, C.L., VERONEN, L.J., AMICK, A.E., VILLEPONTEAUX, L.A. & RUFF, G.A. (1985). **Mental health correlates of criminal victimization: A random community survey.** *Journal of Consulting and Clinical Psychology*, 53, 866-873. A representative sample of 2,003 adult women was interviewed about victimization experiences and mental health problems. After classification of the women into victimization groups, the occurrence of three mental health problems was compared across type of crime. Rates of "nervous breakdowns," suicidal ideation, and suicide attempts were significantly higher for crime victims than for nonvictims. Victims of attempted rape, completed rape, and attempted sexual molestation had problems more frequently than did victims of attempted robbery, completed robbery, aggravated assault, or completed molestation. Problems were not mediated by income and were affected only marginally by age and race. Nearly one rape victim in five (19.2%) had attempted suicide, whereas only 2.2% of nonvictims had done so. Most sexual assault victims' mental health problems came after their victimization. Findings suggest that crime victims are at risk for the development of major mental health problems, some of which are life threatening in nature.

KULKA, R.A., SCHLENGER, W.E., FAIRBANK, J.A., HOUGH, R.L., JORDAN, B.K., MARMAR, C.R. & WEISS, D.S. (1990). **Trauma and the Vietnam War Generation.** New York: Brunner/Mazel. The National Vietnam Veterans Readjustment Study (NVVRS) is the most rigorous and comprehensive study to date of the prevalence of PTSD and other psychological problems in readjusting to civilian life among Vietnam veterans. Fifteen percent of all male Vietnam theater veterans are current cases of PTSD. This represents about 479,000 of the estimated 3.14 million men who served in the Vietnam theater. Among Vietnam theater veteran women, current PTSD prevalence is estimated to be 8.5% of the approximately 7,200 women who served, or about 610 current cases. For both males and females, these rates of current

PTSD for theater veterans are consistently and dramatically higher than rates for comparable Vietnam era veterans (2.5% male, 1.1% female) or civilian counterparts (1.2% male, 0.3% female). An additional 11.1% of male theater veterans and 7.8% of female theater veterans -- 350,000 additional men and women -- currently suffer from "partial PTSD." NVVRS analyses of the lifetime prevalence of PTSD indicate that over one-third (30.6%) of male Vietnam theater veterans (over 960,000 men) and over one-fourth (26.9%) of women serving in the Vietnam theater (over 1,900 women) had the full-blown disorder at some time during their lives. The prevalence of PTSD and other postwar psychological problems is significantly, and often dramatically, higher among those with high levels of exposure to combat and other war-zone stressors in Vietnam, by comparison either with their Vietnam era veteran and civilian peers or with other veterans who served in the Vietnam theater and were exposed to low or moderate levels of war-zone stress. [Adapted from Introduction]

MCFARLANE, A.C. (1986). **Long-term psychiatric morbidity after a natural disaster: Implications for disaster planners and emergency services.** *Medical Journal of Australia*, 145, 561-563. The prevalence and longitudinal course of PTSD were studied in a group of 459 firefighters who were exposed to the Ash Wednesday bushfires in South Australia. The main finding, that the level of morbidity four months after the disaster remained almost unchanged at 29 months, indicates the long-term nature of PTSD. Twenty-nine months after the fire, 21% of the firefighters were continuing to experience imagery of the disaster, in a way that interfered with their lives. The failure of present disaster management plans to recognize the psychological impact of natural disasters and the long-term nature of PTSD is emphasized, and the need for preventive mental health programmes to minimize such morbidity in the future is discussed.

MOLLICA, R.F., WYSHAK, G. & LAVELLE, J. (1987). **The psychosocial impact of war trauma and torture on Southeast Asian refugees.** *American Journal of Psychiatry*, 144, 1567-1572. More than 700,000 refugees from southeast Asia have settled in the United States since 1975. Although many have suffered serious trauma, including torture, few clinical reports have described their trauma-related symptoms and psychosocial problems. The authors conducted a treatment study of 52 patients in a clinic for Indochinese. They found that these patients were a highly traumatized group; each had experienced a mean of 10 traumatic events and two torture experiences. Many of the patients had concurrent diagnoses of major affective disorder and PTSD as well as medical and social disabilities associated with their history of trauma. The authors also found that Cambodian women without spouses demonstrated more serious psychiatric and social impairments than all other Indochinese patient groups.

NADELSON, C.C., NOTMAN, M.T., ZACKSON, H. & GORNICK, J. (1982). **A follow-up study of rape victims.** *American Journal of Psychiatry*, 139, 1266-1270. Of 130 women initially seen in a general hospital emergency room after being raped, the authors were able to interview 41 of the women 1 to 2.5 years after the rape. Half of the women continued to fear being alone and three-quarters reported still being suspicious of others. Many also felt restricted in their daily lives and had self-reported episodes of depression and sexual problems, which they attributed to the rape; none had a history of mental or emotional disturbance. The authors recommend that short-term, issue-

oriented therapy be made available for all rape victims, as well as resources for the treatment of long-term symptoms.

SHORE, J.H., TATUM, E.L. & VOLLMER, W.M. (1986). **Evaluation of mental effects of disaster, Mount St. Helens eruption.** *American Journal of Public Health*, 76 (Suppl. 3), 76-83. This psychiatric epidemiology study following the Mount St. Helens volcanic disaster revealed a significant morbidity for psychiatric disorders. The increased prevalence showed a dose response pattern in three population groups. The findings are reported as relative and attributable risk for the two exposed populations as compared to a control group. Patterns of significant risk are presented for sex, age, and for victims with pre-existing physical illness. The research utilized a new criteria-based interview schedule for the identification of psychiatric disorders. The methodology is reviewed in the context of the controversies and assumptions within the field of behavioral response to disaster stress. There are important implications for public health planning and intervention.

STELLMAN, J.M., STELLMAN, S.D. & SOMMER, J.F. (1988). **Social and behavioral consequences of the Vietnam experience among American Legionnaires.** *Environmental Research*, 47, 129-149. One aspect of a cross-sectional questionnaire study of a sample of Vietnam veterans belonging to The American Legion was devoted to analysis of social and behavioral consequences of service in Southeast Asia. Members of the study population were stratified by whether they served in Southeast Asia and within the Southeast Asia group, by varying degrees of exposure to combat and to herbicides. Using validated scales for behavioral affect and for the exposure measures for combat and herbicides, a wide range of adverse effects was observed. Men who faced high levels of combat intensity were found to be at greater risk for divorce and for generally being less happy and satisfied with their lives, their marriages, their role as fathers, and as sexual human beings. Although in this population they have reached comparatively high levels of education, they earn significantly less money than peers of their same age and educational attainment. Vietnam veterans returning from combat were found to exhibit higher levels of behavioral disturbances, with mean scores for depression, anxiety, irritation, feelings of helplessness, and physical signs of depression significantly worse than non-combat peers. The lifestyle of combat veterans also continues to place them at greater risk for poor health. They smoke, drink, and use prescription drugs at rates significantly greater than the other veterans in this study. Combat veterans have had a significantly poorer rate of reduction and cessation of smoking and drinking than others in this population. Evidence is also presented which shows that, for some of the behavioral outcomes measured, a

ADDITIONAL CITATIONS Annotated by the Editors

BLAKE, D.D., KEANE, T.M., WINE, P.R., MORA, C., TAYLOR, K.L. & LYONS, J.A. (1990). **Prevalence of PTSD symptoms in combat veterans seeking medical treatment.** *Journal of Traumatic Stress*, 3, 15-27.

Screened 161 nonpsychiatric combat and former POW veterans for PTSD while they were inpatients on a medical unit. Seventy percent served in World War II, 13% in Korea, and 17% in Vietnam. According to the Mississippi Scale for Combat-Related PTSD, prevalence of PTSD was 46% in Vietnam veterans, 30% in Korean veterans, and 19% in World War II veterans. Groups did

not differ in combat exposure. The authors suggest that PTSD should be assessed in combat veterans in both medical and psychiatric settings.

BROMET, E., SCHULBERG, H.C. & DUNN, L. (1982). Reactions of psychiatric patients to the Three Mile Island nuclear accident. *Archives of General Psychiatry*, 39, 725-730.

Studied reactions to the Three Mile Island (TMI) nuclear accident by interviewing 151 psychiatric patients in the surrounding area and 64 psychiatric controls from a community with a nuclear plant. No differences were observed between groups in retrospective reports of mental health at the time of the accident, or in concurrent reports 9-10 and 12-13 months later. Poor social support and viewing the TMI situation as currently dangerous predicted symptoms in the TMI group.

CHEMTOB, C.M., BAUER, G.B. & NELLER, G. (1990). Post-traumatic stress disorder among Special Forces Vietnam veterans. *Military Medicine*, 155, 16-20.

Used a self-report questionnaire of DSM-III PTSD symptoms to assess PTSD in 57 Special Forces Vietnam veterans. Prevalence of current PTSD was 25% in this select and rigorously trained group of men. Predictors of PTSD included: poorer preservice familial relationships, being wounded, being wounded after return from leave, having friends missing in action, guilt over the death of a friend, being emotionally unprepared to leave the service, and failing to discuss feelings after the military.

GOLDBERG, J., TRUE, W.R., EISEN, S.A. & HENDERSON, W.G. (1990). A twin study of the effects of the Vietnam War on posttraumatic stress disorder. *Journal of the American Medical Association*, 263, 1227-1232.

Used mail questionnaires and telephone interviews to determine the association between military service in Vietnam and PTSD in a sample of 2,092 male, veteran, monozygotic twin pairs. In the sample of 715 pairs who were discordant for military service in the Southeast Asian theater, PTSD was found in 17% of twins with theater service but in only 5% of co-twins who served outside the theater. Level of combat exposure was positively related to PTSD. The authors note that their twin design eliminates problems of confounding variables in the definition of comparison groups because monozygotic twins share a common genetic and familial environment.

KINZIE, J.D., BOEHNLEIN, J.K., LEUNG, P.K., MOORE, L.J., RILEY, C. & SMITH, D. (1990). The prevalence of posttraumatic stress disorder and its clinical significance among Southeast Asian refugees. *American Journal of Psychiatry*, 147, 913-917.

Interviewed 322 patients at a psychiatry clinic for Indochinese refugees by using a DSM-III-R symptom checklist. Seventy percent met criteria for a current diagnosis and an additional 5% met criteria for a past diagnosis. Prevalence was highest in Miens, a Laotian hill people (93%), and in Cambodians (92%), and lowest in Vietnamese (54%). The authors note that although PTSD is a common disorder in Indochinese refugees, the diagnosis is often difficult to make.

NADER, K., PYNOOS, R., FAIRBANKS, L. & FREDERICK, C. (1990). Children's PTSD reactions one year after a sniper attack at their school. *American Journal of Psychiatry*, 147, 1526-1530.

Conducted a follow-up of 100 schoolchildren 14 months after the children had experienced a sniper attack at their school. Sym-

ptoms of PTSD were reported by 74% of the children who were most directly exposed to the attack and by 19% of those who were less directly exposed. The most common symptom, avoiding reminders of the event, was reported by 90% of the directly exposed group. The authors conclude that more comprehensive psychological services should be provided for children who are directly exposed to violence.

OP DEN VELDE, W., FALGER, P.R.J., HOVENS, J.E., DE GROEN, J.H.M., LASSCHUIT, L.J., VAN DUIJN, H. & SCHOUTEN, E.G.W. (in press). PTSD in Dutch Resistance veterans from World War II. In J.P. Wilson & B. Raphael (Eds.), *International Handbook of Traumatic Stress Syndromes*. Plenum Press: New York.

Studied 147 Dutch male World War II resistance veterans who ranged from 60 to 65 years old. Almost 56% had current PTSD, and another 28% had PTSD in remission, according to interviews conducted with the SCID for DSM-III-R. "Vital exhaustion," a syndrome of signs of unusual tiredness and general malaise, was more likely to be reported in the current PTSD group than in those who had PTSD in the past or who never had PTSD. Six longitudinal patterns of symptoms were reported, with the most frequent (36%) being delayed onset with intermittent remissions and exacerbations up to the present.

PALINKAS, L.A. & COBEN, P. (1987). Psychiatric disorders among United States Marines wounded in action in Vietnam. *Journal of Nervous and Mental Disease*, 175, 291-300.

Examined records of all hospital admissions for active-duty Marines for the period 1965 to 1972 and identified personnel having a combat-related wound or injury and/or a psychiatric hospitalization. Results indicated that, compared with Marines not wounded in Vietnam, Marines wounded in Vietnam were at significant risk for having a psychiatric hospitalization. Most of the psychiatric first hospitalizations occurred before being wounded in action, however, and psychiatric patients who were treated and then returned to duty had a significantly greater than expected risk of being subsequently wounded.

PITMAN, R.K., ALTMAN, B. & MACKLIN, M.L. (1989).

Prevalence of posttraumatic stress disorder in wounded Vietnam veterans. *American Journal of Psychiatry*, 146, 667-669. Administered the Mississippi Scale for Combat-related PTSD in a survey of 243 combat veterans with a service-connected disability for a musculoskeletal injury received in Vietnam. The prevalence of definite or probable lifetime PTSD was 40% in the 156 respondents, with diagnosis based on clinical interview in selected cases. Only 40% of men with PTSD had a service-connected disability for PTSD.

STRETCH, R.H. (1985). Posttraumatic stress disorder among U.S. Army Reserve Vietnam and Vietnam-era veterans.

Journal of Consulting and Clinical Psychology, 53, 935-936. Sent the Vietnam-Era Veterans Adjustment Survey to a stratified random sample of 1,000 Vietnam veterans and 1,000 Vietnam-era veterans, all of whom were active in the U.S. Army Reserve at the time of the survey. Among respondents, prevalence of PTSD was 10.9% in Vietnam veterans (73 of 667) and 1.5% in era veterans (4 of 258). Relatively higher levels of combat in Vietnam and poorer social support upon return predicted more PTSD symptomatology.

TRUE, W.R., GOLDBERG, J. & EISEN, S.A. (1988). Stress symptomatology among Vietnam veterans: Analysis of the

Veterans Administration Survey of Veterans II. *American Journal of Epidemiology*, 128, 85-92.

Analyzed data on Vietnam service, combat exposure, and eight symptoms of PTSD in a randomly sampled group of 1,787 Vietnam era veterans. Level of combat exposure was related to all symptoms in a dose-response pattern, even after controlling for demographic and other military service variables. Military service in Vietnam was associated with increased symptomatology; using non-Vietnam service veterans as the reference category adjusted odds ratio for symptom prevalence ranged from 1.39 to 3.74. Being nonwhite, less educated at discharge, and younger at discharge each independently increased the probability of symptoms.

TUCKER, P. (1987). Psychosocial problems among adult burn victims. *Burns*, 13, 7-14.

Administered interviews and questionnaires to 22 inpatient and 9 outpatient adult burn victims seen in a hospital burn unit. Prevalence of PTSD was 19% in inpatients and 33% in outpatients. A history of psychiatric morbidity before being burned was associated with poor post-burn psychosocial adjustment.

PILOTS UPDATE

We were gratified by the enthusiastic response to our display of a developmental version of the PILOTS database at the International Society for Traumatic Stress Studies meeting in New Orleans. One aspect of this response surprised us: several people asked if the database might be available on diskette, so that they could load it onto their hard disks and search it using Pro-Cite software. We are now investigating this and other options (such as CD-ROM and Internet) for distributing the PILOTS database. These would supplement rather than replace our existing arrangements to make PILOTS available for interactive online searching as part of the Combined Health Information Database (CHID) on the BRS system. We still expect to have 2,000 basic bibliographical records available for searching on CHID/BRS in April 1991.

One question that we have often been asked is how we intend to identify, collect, and index all of the PTSD literature. This is a particularly challenging goal when dealing with an international, interdisciplinary field. We intend to go about it in an international, interdisciplinary way.

Although we are concentrating at first on the English-language PTSD literature indexed in a small number of well-known bibliographies and databases, we realize that we cannot restrict ourselves to the obvious sources. In addition to MEDLINE (the National Library of Medicine's database) and PsycINFO (the online version of *Psychological Abstracts*), there are many other databases to search. EMBASE (the online *Excerpta Medica*) has already yielded several hundred articles not found in MEDLINE or PsycINFO; Social Work Abstracts and the Child Abuse and Neglect database have provided additional citations; and, a bit farther afield, the Religion Index database has led us to an article on "Psychiatry and self in Bible and

Talmud: the example of posttraumatic stress disorder and enemy *herem*," in the Israel Institute of History and Medicine's journal *Koroth*. We hope to collect and index all of these publications and add them to PILOTS during 1991.

We do not intend to limit PILOTS to material in English, which means that we shall be examining printed bibliographies and searching online databases from European, Asian, and other sources as well as those commonly used in the United States. While many of these are produced in English or in other languages accessible to our staff, some are not. We shall have to recruit outside assistance to ensure that PILOTS covers *all* the world's literature on PTSD.

By "literature" we do not mean just books and journals. Librarians and information scientists use the term "grey literature" to refer to material disseminated outside the established channels of publication, such as government documents, technical reports, and doctoral dissertations. There is an extensive grey literature on PTSD, and we intend to index it in PILOTS. This is going to be a difficult project. Despite the best efforts of the Government Printing Office and the Library of Congress, many publications of U.S. government agencies are not listed in official catalogues; and what librarians like to call "bibliographic control" over the publications of state and local governments is rudimentary, at best. There are hundreds of private agencies that are potential publishers in this field, including veterans' organizations, refugee treatment centers, and religious groups.

The challenge of locating and obtaining this material is intensified when dealing with foreign publications. Fortunately, we do not need to do this on our own. We have been exploring with organizations in other countries the possibilities for collaboration on bibliographical projects, ranging from exchanging copies of bibliographical records to establishing international standards for the organization and indexing of PTSD databases. We would like to hear from any group or individual involved with recording, collecting, or indexing the PTSD literature, with a view to making international collaboration as extensive as possible.

We hope that this collaboration will speed the day when all of the world's PTSD literature will be scientifically indexed and readily available to those who would use it for the prevention and alleviation of mental illness.

The following articles were incorrectly cited in our last issue:
 RAUSCH, J., BUTLER, R., BRAFF, D., JENKINS, M., SPROCK, J. & GEYER, M. (1990). **Empirical confirmation of an exaggerated startle response in PTSD.** *Biological Psychiatry*, 27:165A-166A.
 WOLF, M., LIPPER, S. & MOSNAIM, A. (1990). **Carbamazepine and the kindling hypothesis of PTSD.** *Biological Psychiatry*, 27: 81A.

In this and in future issues of the Research Quarterly, we shall present an invited review of the research program at a selected VA Medical Center in order to highlight ongoing PTSD research in the VA system. We are pleased to begin the series with a description written by Patrick A. Boudewyns, PhD, Chief of Psychology at the Augusta VA, of the exciting activities of the Augusta War Trauma Project.

RESEARCH INTO THE PSYCHOLOGICAL AFTERMATH OF WAR: THE AUGUSTA WAR TRAUMA PROJECT

Patrick A. Boudewyns, PhD

Augusta VAMC and Medical College of Georgia

In 1980 Mansell Pattison was the newly appointed Chairman of the Department of Psychiatry at the Medical College of Georgia (MCG). He began his tenure by recruiting a faculty who shared his belief that scientific enquiry in the mental health disciplines is best advanced in an environment that encourages collaboration between scientists at all levels of the biopsychosocial continuum. Pattison was convinced that mental health disciplines must come to understand complex biopsychosocial interactions in order to effectively treat multifaceted mental disorders such as PTSD. It was in this fertile academic and clinical milieu that the Augusta War Trauma Project was conceived.

The goal of the project was to identify and develop resources to support creative research programs at both the VA and MCG involving the treatment and assessment of problems and disorders suffered by combat veterans. A crest and a logo, "Toward a better understanding of the personal aftermath of war and the development of effective treatment for the psychological casualties of combat," were contributed by the patients on our newly organized special treatment unit for PTSD.

A key person in the development of the project, and one of the most productive researchers from the beginning, has been Dr. Lee Hyer. With his help a small start-up grant was obtained to computerize our psycho-diagnostic lab and to outfit a psychophysiological laboratory with equipment that would now be described as antique. Technicians were borrowed from existing programs to help collect and store what has become a large and complex database. (We treated 357 separate inpatients with PTSD at Augusta last year.) Researchers from the VA and MCG were encouraged to use the database for locally approved research projects, and to date, 24 researchers have published papers based on its contents.

Since 1984, five research grants totaling \$441,840 have been awarded to VA psychologists and psychiatrists at Augusta to study PTSD in combat veterans. During that same time five other grants totaling \$1,000,124 have been funded in related areas such as treatment of addictions and alcoholism, psychophysiological aspects of spinal cord injury, and neuropsychological evaluation of chronic veteran psychiatric patients. More than 60 research papers related to PTSD have been published by researchers at both institutions in the past seven years. I was asked by the editors to select 10 of these articles for the bibliography

that follows. This selection, I feel, aptly demonstrates that we have been faithful to our biopsychosocial philosophy.

Future research projects at Augusta will include testing of a new and promising exposure / desensitization technique for the treatment of intrusive thoughts and memories (Shapiro, 1989) and exploring the possibility that there may be a diagnostic predictor of PTSD as measured by the variance in startle and orienting response modulation, using eye blink as a dependent measure (Ornitz & Pynoos, 1989). We also plan to continue longitudinal studies of the lifetime course of PTSD and its co-morbidities.

I must end on a sad note. On September 9, 1989, at the age of 56, Edward Mansell Pattison, MD, died from injuries received in an automobile accident months earlier. We miss his incredible energy and support from which we benefited so much in the "start-up" years here at Augusta. Psychiatry lost one of its best and most productive scholars.

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