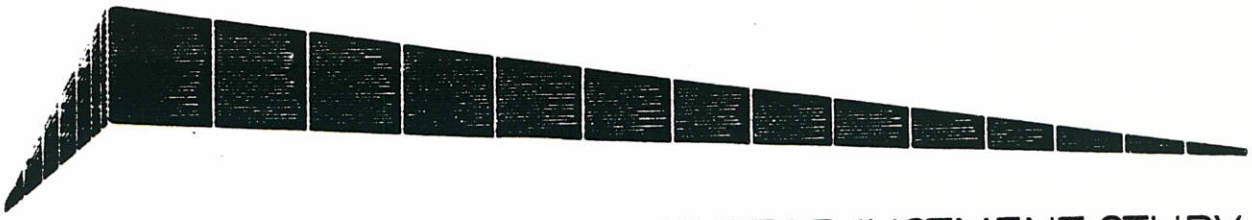

NATIONAL VIETNAM VETERANS READJUSTMENT STUDY

Research Triangle Institute

NATIONAL VIETNAM VETERANS READJUSTMENT STUDY (NVVRS):

DESCRIPTION, CURRENT STATUS, AND INITIAL PTSD PREVALENCE ESTIMATES

Submitted to the U.S. Senate Committee on Veterans' Affairs
as Testimony for the Oversight Hearing on
Post-Traumatic Stress Disorder

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REFERENCES

I. OVERVIEW

A. Purpose

This document has been prepared in response to Senator Alan Cranston's letter of June 24, 1988, inviting the research team of the National Vietnam Veterans Readjustment Study (NVVRS) to prepare and present testimony for an oversight hearing on Post-Traumatic Stress Disorder (PTSD) to be held by the U.S. Senate Committee on Veterans' Affairs on July 14, 1988. As requested in that letter and in conversations with Committee staff, this written testimony consists of five elements: (1) a brief overview of the background and objectives of the NVVRS, and a detailed summary of the NVVRS study design; (2) a description of the current timetable and costs of this research project; (3) a description of the criteria and methods used to assess PTSD in the NVVRS; (4) a presentation the first estimates of the prevalence of PTSD based on these methods; and (5) a comparison of the NVVRS estimates with those recently presented by the Centers for Disease Control based on their Vietnam Experience Study, including a discussion of differences in criteria, samples, and methods used to assess PTSD in both studies. Additional technical details are provided in five appendices.

B. Background

With the evacuation of Saigon on March 25, 1973, the role of overt American intervention in the Republic of Vietnam was terminated, and on May 7, 1975, President Gerald R. Ford proclaimed an end to the "Vietnam era." By September 30, 1983, an estimated 8,238,000 men and women who served in the U.S. Armed Forces (both in the Vietnam theater and elsewhere) during the Vietnam era (which officially began on August 5, 1964) had returned to civilian life (U.S. Veterans Administration, 1983). During the thirteen years since the Ford proclamation, the Nation has hotly debated the nature and extent of the problems faced by these Vietnam-era veterans in readjusting to civilian life. Hundreds of articles and dozens of books concerning Vietnam veterans' readjustment to

civilian life have been published, and the plight of these veterans has been a popular theme in the news media, television, and the movies. In part, this increasing public interest in the Vietnam war and its veterans reflects some dramatic and precedent-setting changes in the country's socioemotional climate in recent years, changes that have gradually depoliticized somewhat the debate over the mental health of Vietnam veterans.

It is also clear, however, that at least for a significant minority of the men and women who served during the Vietnam war, "the war is not yet over," in that they continue to suffer from emotional turmoil 15-20 years or more after the end of their military service and return to civilian life. Yet previous estimates of the actual numbers of veterans in need have varied widely, from as few as 250,000 (e.g., Wilson, 1978) to over 2 million (Egendorf, 1982). Thus, while there is general consensus that some Vietnam veterans suffer from PTSD and other psychological problems in readjusting to civilian life, precise national estimates of the number of Vietnam veterans experiencing such problems have simply not been available. Recognizing the critical need for such information, in the 1983 renewal of the VA's Readjustment Counseling Program (Public Law 98-160) the U.S. Congress mandated the conduct of a "study of the prevalence and incidence of post-traumatic stress disorder (PTSD) and other psychological problems in readjusting to civilian life" among Vietnam veterans. The study was to be of sufficient size, scope, complexity, and design to provide national estimates of the extent of Vietnam veterans' mental health and other health needs and to permit sophisticated analyses of the nature, scope, covariation, and etiology of their readjustment difficulties. On September 12, 1984, the Veterans Administration (VA) awarded a contract to the Research Triangle Institute (RTI) and its collaborators to conduct this mandated study, which came to be known as the National Vietnam Veterans Readjustment Study (NVVRS).

C. Study Objectives

The NVVRS has three broad goals, as mandated by the Congress and evolved by the VA, its consultants, and the research team (see Exhibit I-1). The first major goal of the study is to provide information

Exhibit I-1

Objectives

Conduct a Comprehensive Study in the Population of Vietnam Veterans (VVs)

I. PREVALENCE AND INCIDENCE OF:

- A. Post-Traumatic Stress Disorder (PTSD)
- B. Other Psychological Problems of Readjusting to Civilian Life--Other "Post-War Psychological Problems" (PWPPs)
  - 1. Other DSM-III Psychiatric Disorders
  - 2. Malfunctions in:
    - A. Marital Roles
    - B. Familial Roles
    - C. Vocational Roles and Careers
    - D. Educational Roles and Careers
  - 3. More General and Subjective Disturbances
    - A. Life Satisfactions, Dissatisfaction, Quality of Life
    - B. Demoralization or Non-Specific Distress

II. EFFECTS OF PWPPs ON SUCH VETERANS, ESPECIALLY:

- A. Those With Service-Connected Disabilities
- B. Women Veterans

III. ASSESS CORRELATIONS BETWEEN PTSD AND OTHER PWPPs:

- A. Physical Disabilities (By Type)
- B. Alcohol and Drug Abuse
- C. Minority Group Membership
- D. Incarceration in Penal Institutions

IV. EVALUATION OF LONG-TERM EFFECTS OF PWPPs ON:

- A. Families
- B. Others in Primary Social Relationships

V. EXTENT TO WHICH VVs WITH PWPPs USE VA AND OTHER RESOURCES

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about the incidence, prevalence, and effects of post-traumatic stress disorder and related post-war psychological problems among Vietnam veterans.

A second major goal of the study is to provide a comprehensive description of the total life adjustment of Vietnam theater veterans and to compare their adjustment to that of era veterans (i.e., persons who served in the Armed Forces during the Vietnam era but did not serve in the Vietnam theater) and nonveterans. It is intended that this description document in the aggregate the course of the lives of these three groups: the problems they have faced, the ways in which they have coped, and the quality of their lives. The description covers many dimensions of life--education, work, family, interpersonal relations, emotional stability, etc. The aim is to look at the broad spectrum of adjustment and to identify factors that have made both positive and negative contributions to these citizen's lives.

A third major goal of the study is to provide detailed scientific information about one specific type of post-war psychological problem: post-traumatic stress disorder (PTSD). Of particular interest are its antecedents, its course, its consequences, and its relationship to other physical and emotional disorders. Relationships between PTSD and other post-war psychological problems, physical disabilities, substance abuse, minority group membership, and criminal justice involvement are all to be examined. Additionally, information describing the impact of post-war psychological problems on veterans' families and on their use of VA facilities is to be developed. In short, nothing less was required than perhaps the most far reaching and ambitious national mental health epidemiological study ever attempted on any population.

D. Study Design

1. Overview of Major Components

Clearly, to achieve these broad and very ambitious objectives a rather extraordinary research design was needed, one requiring careful attention to sampling and location procedures, instrument development and validation, data collection, and numerous other special methodological

issues. In addition, the controversial nature of some of the study's subject matter (e.g., PTSD), the intense interest in the study on the part of groups across the political spectrum, and the programmatic implications of the study's findings have all acted to underscore the importance of the design to the ultimate utility of the study's findings. If the findings are to be useful to policy makers, they must be credible to the scientific community, to various political interest groups, and ultimately to the Congress. As with all research projects, the credibility of the findings from the Readjustment Study is predicated on the rigor of its research design.

To meet the Readjustment Study's ambitious informational and methodological objectives, RTI proposed a design with multiple components. The component designed to meet the study's major informational objectives was the National Survey of the Vietnam Generation (NSVG). The NSVG research design involved indepth face-to-face interviewing averaging 3 to 5 hours in length with samples drawn to represent the study's three major groups of interest. These are: (1) Vietnam theater veterans--persons who served on active duty in the U.S. Armed Forces during the Vietnam era (August 5, 1964, through May 7, 1975) and who served in Vietnam, Laos, or Cambodia or their surrounding waters or airspace, (2) Vietnam era veterans--persons who served on active duty in the U.S. Armed Forces during the Vietnam era who did not serve in the Vietnam theater, and (3) nonveterans or civilian counterparts--persons who did not serve in the military during the Vietnam era, matched on age, sex, race/ethnicity, and (for women) occupation to the theater veterans. In order to assure that critical statistical comparisons could be made reliably, certain subgroups were oversampled. These included blacks, Hispanics, women, and theater veterans with service-connected disabilities.

The content of the survey interview was designed to cover the broad spectrum of adjustment, including such topics as marriage and family, education and occupation, military service and Vietnam experience, stressful and traumatic life experiences, substance use, psychiatric disorder, physical health, and use of health and mental health services. A summary outline of the topics covered and the average number of minutes of interview time allocated to each is shown in Exhibit I-2.

Exhibit 1-2

National Vietnam Veterans Readjustment Study:
"National Survey of the Vietnam Generation"--
Average Interview Times by Section
for the Household Interview

	Section/Title	Time in Minutes: Vietnam Theatre Veterans	Vietnam Era Veterans	Civilian Counterparts
SECTION A:	Preamble and Eligibility	2	2	2
SECTION C:	Marital History and Adjustment	10	10	10
SECTION D:	Parenting History and Adjustment	10	10	10
SECTION E:	Educational History	6	6	6
SECTION F:	Occupational History and Work Role Adjustment	9	9	9
SECTION G:	Childhood and Family History	12	12	12
SECTION H:	Military Service History	16	16	2
SECTION J:	Vietnam Experience	60	--	--
SECTION K:	Post-Service	22	22	--
SECTION M:	Stressful and Traumatic Life Events	22	18	10
SECTION N:	Self-Perceptions, Attitudes, and Nonspecific Distress	18	18	24
SECTION P:	Physical Health Status	9	9	9
SECTION R:	Diagnostic Interview Schedule (DIS)	79	73	72
SECTION S:	Use of Health and Mental Health Services	16	15	13
SECTION T:	Social Support	6	6	5
SECTION U:	Demographics	11	11	11
TOTALS		308	237	195
		5:08 Hrs.	3:57 Hrs.	3:15 Hrs.

Three additional components of the NVVRS that are closely related to the NSVG are also of key importance in meeting the study's objectives. These are a Preliminary Validation Study component conducted and analyzed prior to (and in preparation for) the NSVG, and the Clinical Interview and Spouse/Significant Other Interview components, both conducted subsequent to the NSVG interview.

Because at the time this study was initiated none of the measures currently available for a survey-based assessment of post-traumatic stress disorder had yet been validated, an integral part of the study design was the fielding of an elaborate Preliminary Validation Study component. Candidate PTSD measures were administered to 225 Vietnam theater veterans whose mental health status with regard to PTSD and other psychiatric disorders was known, who were identified by persons in the VA system. The purpose of this validation study was to determine how well diagnostic decisions about PTSD made on the basis of information collected in a survey interview would correspond with diagnostic decisions made by trained clinicians with extensive experience in the diagnosis and treatment of PTSD. This component served as the basis for selecting among candidate instruments to be used in the NSVG based on their demonstrated validity in diagnosing PTSD.

For the Clinical Interview component, a subset of over 300 theater veterans and 100 era veterans was selected to undergo a follow-up clinical interview with an expert mental health professional. This was a semi-structured diagnostic interview, and its purpose was to provide additional information about the validity of diagnoses made on the basis of information collected in the survey interview, in particular the validity of the diagnosis of PTSD. These interviews were conducted by mental health professionals located in 28 specific geographic areas around the country who are experienced in working with stress disorders. The Clinical Interview sample was drawn from among theater and era veteran respondents to the NSVG survey interview who lived within "reasonable commuting distance" of these 28 areas, and included all those who appeared on the basis of their survey interview to be PTSD positive, and a sample of those who appeared to be PTSD negative.

The Spouse/Significant Other component involved one-hour followup interviews with the spouses or other co-resident partners of over 450

theater veterans. The purpose of these interviews was to collect information about the veteran from a collateral, and to assess the impact of post-war psychological problems of Vietnam theater veterans on persons sharing their lives with these veterans. The Spouse/Significant Other subsample was selected from the entire theater veteran sample to include adequate numbers of both spouses or partners of veterans whose survey interviews suggested substantial levels of post-war psychological problems and spouses/partners of those without such problems.

2. Sample Design of the NSVG

Two important requirements in the design of the NSVG were (1) that the sample of persons interviewed be nationally representative of the corresponding populations, and (2) that adequate comparison groups be included to provide a context for understanding the current adjustment problems of Vietnam veterans. To meet these requirements, the NSVG design specified the selection of national probability samples of Vietnam (theater and era) veterans and their civilian counterparts of sufficient size to support estimates for and contrasts among the groups of interest. These contrasts include those for theater and era veterans (male and female), for theater veterans and nonveterans (male and female), for subgroups of theater veteran males (black, Hispanic, and white/others), and for Vietnam theater veterans exposed to different levels of combat or war zone stress.

To meet these requirements, the NSVG sample design combined (1) a military records based sample designed to yield 1,500 Vietnam theater veterans and 730 era veterans, (2) a household sample of 450 male and 50 (non-nurse) female civilian counterparts, and (3) a list sample of 150 female civilian registered nurses. The Vietnam theater veteran sample was augmented with 100 theater veterans with service-connected disabilities, for a total of 1,600 theater veterans.

For this study, the veteran respondent universe was defined as all persons who served on active duty in the military forces of the United States during the Vietnam era (August 5, 1964 through May 7, 1975), except those currently on active duty. Under this definition, career retirees, enlistment terminations, and persons who served on active duty during the

Vietnam-era and are now reservists or National Guard personnel are all included. By this definition the study population contains an estimated 93 to 94 percent of all living persons who served on active duty during the Vietnam era, the most comprehensive coverage of the Vietnam veteran population of any study conducted to date.

The task of selecting the veteran samples was complicated by the simple fact that there exists no master list of the over 8 million veterans who served during the Vietnam era. Consequently, one of the study's initial tasks was to create such a list (or sampling frame) from which the samples of veterans could be selected. The most common means for doing this in past studies was to screen households either by telephone or in-person to identify Vietnam era veterans. However, this approach necessarily relies on self or proxy reports to identify veterans, and the screening rates obtained by the most rigorous surveys employing this method (Fischer et al., 1980; Rothbart et al., 1982) suggest significant underreporting of Vietnam theater and era veteran status, resulting in undercoverage on the order of 32-38 percent relative to 1980 Census data. As a result, the NVVRS sampling frame for veterans was compiled from three different sources of military personnel records: (1) the National Personnel Records Center (NPRC); (2) the Defense Manpower Data Center (DMDC); and (3) a special list compiled for the VA by the Department of Defense's Environmental Support Group (ESG), reported to contain the names of all female theater veterans.

From a sample of 34,000 accession numbers selected from the NPRC Chronological Model (which includes accession numbers assigned to personnel records received between January, 1966, and June, 1977), 25,000 personnel records were fully abstracted, and a total of 966 cases were selected from the master data files at DMDC. These two sources served as the basis of the male theater and era veteran samples. These surveys were designed to include sufficient numbers of minority members to produce the required oversamples of blacks and Hispanics. While the number of black veterans available was sufficient for the black oversample, the number of Hispanics was insufficient to provide an adequate yield. Therefore, a supplemental sample of 6,800 accession numbers from NPRC was required to obtain adequate numbers of Hispanic male theater veterans to meet the statistical requirements of the study.

The NPRC and DMDC files were also the basis of the female era veteran sample. However, because more than 80 percent of women veterans serving in the Vietnam theater were nurses, the sample design for female Vietnam era veterans was modified to produce a similar proportion of nurses in that subsample to ensure more valid comparisons between these two groups. In order to obtain adequate numbers of era veteran nurses for that purpose, a sample of 205,000 accession numbers from the NPRC Chronological Model was screened for all potential female names. The military records for all those with potentially female names were retrieved and examined to determine gender, and all records verified as female were abstracted to identify nurses based on the recorded military occupational specialty (MOS). Finally, the female theater veteran sample was drawn from the ESG list of female theater veterans.

3. Implementation

While it may not be readily apparent from this brief description, the implementation of this complex, multiple component study design proved to be especially challenging; indeed, a formidable test of the hypothetical limits of survey research. For example, although identification of the veteran samples from military records provided the advantage of a more representative sample than could have been achieved through identification via household screening, it had the distinct disadvantage of requiring the research team to track down all sampled veterans wherever they may currently be living, in order to interview them. The resulting sample was scattered literally throughout the world, and tracing information from military records was often up to 20 years old. However, through an interagency agreement with the National Institute of Occupational Safety and Health (NIOSH), it was possible to obtain current addresses for most veterans from the Internal Revenue Service (IRS), with the remainder located by specialized tracing procedures. Even when located, the sample was very widely scattered, and interviews were conducted in virtually every corner of the 50 states and Puerto Rico. This resulted in an unusually high level of interviewer travel (averaging 200 miles and 7 hours per case for theater veterans), in conjunction with the administration of a highly sensitive interview

averaging 3-5 hours in length. In turn, the complexity and sensitivity of the latter required 10 full days of training and a special certification procedure for over 140 interviewers.

In spite of these and some other unique and formidable challenges, the NVVRS was able to successfully achieve virtually every performance objective established for this landmark study. In the NSVG, it was possible to locate over 95 percent of the veterans sampled (over 96 percent of the theater and 93 percent of the era veterans). The 3,016 total interviews conducted exceeded the targeted number of 2,980. For Vietnam theater veterans, over 83 percent of those sampled and eligible (87 percent of those located and eligible) were interviewed, ranging from 81 percent among Hispanic male theater veterans to 86 percent for female theater veterans. Response rates for Vietnam era veterans and nonveterans were 76 and 70 percent, respectively, reflecting in part the lower salience of the survey to these groups in relation to the level of burden required for their participation. Similarly, 344 of the 403 Vietnam theater veterans selected for the Clinical Interview component (85%) were successfully interviewed, ranging from 80 percent among Hispanic males to 97 percent among women, as well as 95 of the 116 era veterans (82%). Of the 557 theater veterans selected for the spouse/significant other interview (for whom there was an eligible co-resident spouse or partner), 474 resulted in a completed interview, for an overall response rate of 85 percent--ranging from 83 percent for black and Hispanic males to 91 percent for the female theater veterans.

II. CURRENT STATUS OF THE NVVRS

A. Timetable

The Request for Proposals (RFP) to conduct the NVVRS specified a period of performance of 42 months, implying the delivery of a final report and executive summary to the VA in mid-March of 1988. In its proposal, however, RTI suggested that the field data collection period might be reduced from 15 to 12 months, allowing some additional time to evaluate Validation Study results and reducing the overall study timetable from 42 to 40 months. This proposal was accepted by the VA, with a starting date of September 12, 1984, and an implied ending date of approximately January 12, 1988. Currently, then, the project is approximately 6 months behind schedule, and the following timetable of remaining activities indicates a completion date approximately 10 months later than that specified in the original project schedule:

Activity	Original Proposal		Current Schedule	
	Start	Finish	Start	Finish
Advance Data Report (to VA)	02-15-86	06-15-86	03-18-87	08-15-87
Analysis of Full Study Sample and Preparation of Final Report	10-15-86	11-15-87	04-15-88	10-06-88
Presentation of Draft Analyses to the VA	--	04-15-87	--	08-15-88
Draft Final Report to the VA	--	11-15-87	--	10-06-88
Submission of Revised Final Report and Executive Summary to the VA	--	01-12-88	--	11-07-88

Although the Advance Data Report was submitted to the VA approximately 14 months later than originally specified, and other delays have also been incurred, it is currently envisioned that a draft final report will be submitted to the VA on October 6, 1988, and revised for final submission by November 7, 1988, 9.75 months later than the date originally proposed (and 6.75 months after the dated implied in the RFP).

B. Study Costs

When the contract to conduct the NVVRS was awarded on September 12, 1984, the estimated cost to conduct the research was $3,620,024. Due to the study's comprehensive objectives, however, in addition to a desire by the VA and its Scientific Advisory Board to review, guide, and revise the study design as the project evolved, substantial revisions and enhancements to the study were recommended almost immediately upon contract award and continued throughout the study. As a result, the NVVRS that was conducted was very much different from the study described in the original proposal.

The first such recommended changes were increases in interview length and a comprehensive redesign of the proposed validation study to increase the scientific rigor of that component. Additions to the primary research staff were also recommended and approved, and, most recently, a clinical interview follow-up component for Vietnam era veterans was implemented. Though each of these changes served to increase the scientific rigor and quality of the NVVRS, the resulting study as implemented was quite different than that envisioned in RTI's original proposal. In addition, due to the study's virtually unprecedented complexity and the "ground-breaking" nature of several of its components, it was substantially more time-consuming, difficult, and expensive to carry out than had been envisioned.

Reflecting both of these major influences, the authorized level of funding for this study was increased several times after contract award, most recently to $8,624,860. As of the end of May, 1988, $8,458,153 had been spent. At the most recent review of the budget with VA staff on March 10, 1988, the projected cost to completion for the NVVRS was $9,349,045, with estimated final expenditures attributable to the following basic components:

	Component	Cost
1.	Instrument Development	$ 237,306
2.	Validation Study--Design and Analysis	431,384
3.	Abstraction of Military Records	376,927
4.	Sample Design, Selection, and Weighting	514,589
5.	Tracing	127,342
6.	Materials Preparation and Interviewer Training	692,374
7.	Interviewing, Editing, and Coding	3,576,797
8.	Data Processing	842,937
9.	Clinical Interviewing	387,955
10.	Analysis and Report Preparation	904,139
11.	Subcontracts for Co-Principal Investigators	574,079
12.	Management and Contractual Reporting	683,216
	Total	$9,349,045

III. ASSESSMENT OF PTSD IN THE NVVRS

Reflecting the emphasis on PTSD in the Congressional mandate, the central concern of the research team in designing the Readjustment Study was the creation of a research design that would maximize the accuracy of the study's estimate of the prevalence of PTSD among Vietnam theater veterans. This concern was expressed through two important features of the NVVRS design. First, at the time that the NVVRS was being planned, the American Psychiatric Association (APA) was in the process of revising its Diagnostic and Statistical Manual (DSM-III), the document that provides the "official" definition of psychiatric disorders in the United States. To assure that the NVVRS assessment of PTSD was consistent with the official definition of PTSD that would be in place by the time NVVRS findings became available, the research team coordinated its efforts with the group working on revising the psychiatric taxonomy--APA's Workgroup to Revise DSM-III. RTI co-sponsored the meeting of the Ad Hoc Panel on the Definition and Measurement of PTSD, whose recommendations for revising the diagnostic criteria for PTSD were incorporated into the revised PTSD definition. As a result of this coordination, the NVVRS clinical estimates of PTSD prevalence are estimates of the prevalence of the disorder as defined in the current official taxonomy (and therefore in use by the VA system).

Second, the bedrock of the accuracy of any diagnostic procedure is it's validity--i.e., the extent to which the procedure classifies individuals in whom the disorder is truly present as cases, and those in whom the disorder is truly absent as noncases. To achieve the objective of diagnostic accuracy, RTI proposed a double validation design that involved conduct of a preliminary validation study prior to launching the national survey (i.e., the NSVG), followed by a second validation study to run concurrent with the national survey. The nature and purposes of these validation components, and the methods for integrating validation study findings with those of the national survey to formulate population prevalence estimates, are described in the following sections.

A. Preliminary Validation Study

One of the fundamental principles on which RTI's original proposal to conduct the NVVRS was founded was that the national survey component of the study should not go to the field until there was sufficient evidence that cases of PTSD could be validly identified on the basis of survey interview information. This was seen as necessary because although several existing survey instruments purporting to identify PTSD had been used in prior research, there was no published information concerning the validity of any of those instruments.

Therefore, the NVVRS design called for a preliminary study to examine the ability of several candidate survey measures to discriminate "true" cases of PTSD from "true" noncases. The Scientific Advisory Committee overseeing the conduct of the NVVRS on behalf of the VA concurred with the need for this preliminary study, and recommended a more rigorous design than that originally proposed. The validation study as it was conducted involved administering a package of candidate PTSD instruments to a group of subjects whose diagnostic status was known. The diagnostic status of subjects, who were mostly veterans undergoing psychiatric treatment, was "known" because their chart diagnosis and the diagnosis made by an expert clinician agreed on the presence or absence of PTSD. The expert clinician's diagnosis was made on the basis of an independent diagnostic interview conducted blind to the chart diagnosis

Results of the study indicated that several instruments in the package could classify people as cases or noncases of PTSD with acceptable accuracy. These findings served as the basis for decisions about the package of instruments to be included in the NSVG (details of the design and findings of the preliminary validation study are provided in Appendix A).

B. Clinical Subsample

The preliminary validation study provided information suggesting that it was prudent to proceed with the national survey component of the NVVRS. However, it did not (and it was not intended that it would) provide complete information about every aspect of the validity of the survey-based PTSD measures. This is true in part because the validation study's

subjects were (of necessity) people who had sought treatment for their mental health problems, and there is evidence in the research literature that persons who seek mental health treatment are different in many ways from people who meet the diagnostic criteria for a psychiatric disorder but who do not seek treatment for it. Since the national survey component of the NVVRS involved a community sample, rather than a treatment seeking sample, it is to be expected that the relationship between the diagnostic measures and "true" diagnosis (i.e., the validity of those measures) would be somewhat attenuated from the estimate made on the basis of a treatment seeking population.

For this reason the NVVRS design contained a clinical subsample component. The primary purpose of the clinical subsample component was to provide additional information about the correspondence between PTSD measures included in the survey interview and "true" PTSD. The clinical subsample was designed as a multimethod validity study, in which multiple PTSD measures, including a semistructured interview conducted by an experienced mental health professional, could be brought to bear on the diagnostic decision. Thus a "triangulation" method for case determination was planned, in which information collected through a variety of methods and from a variety of sources would be taken into account in the diagnostic decision process.

Each clinical subsample respondent underwent a semistructured clinical interview that resulted in a diagnostic decision about PTSD. In addition, the clinician who conducted the interview completed several clinical scales describing his/her clinical impression of the respondent, and the respondent completed several self-report PTSD scales. Also, the spouse/significant other (if there was one) of each clinical subsample respondent was also interviewed. As a result, the research team had at its disposal 5 self-report scales directly related to PTSD (plus a number of other psychiatric symptom scales that are related to PTSD but less directly so), and 4 clinical judgment scales, for clinical subsample respondents. This is the information base on which PTSD case determinations were made.

C. PTSD Diagnostic Procedures

Two methods have been selected to make diagnostic decisions about PTSD in the NVVRS. The first is the clinical DSM-III-R diagnosis, and is the

diagnosis made by an experienced mental health professional on the basis of a semistructured diagnostic interview.

Although the research team has great confidence that a PTSD diagnosis made by a trained and experienced mental health professional based on a thorough clinical interview is the best single indicator of the presence or absence of PTSD, we also recognize that no diagnostic procedure is completely error free. Therefore, we sought a way of combining information from the full range of available indicators to form a "composite" PTSD diagnosis. The basic idea of the composite diagnosis is to examine the information available from multiple PTSD indicators, including but not limited to the clinical interviewer's diagnosis, and in those cases where there is some discrepancy among the indicators to use the full array of additional PTSD information to make a diagnostic decision.

Simply stated, composite diagnoses were made on the basis of a detailed review of the PTSD information for each individual clinical subsample subject. Review began by examining the study's three main indicators--the Mississippi Combat-Related PTSD (M-PTSD) scale, the clinical interview (SCID) PTSD diagnosis, and the PTSD scale of the Minnesota Multiphasic Personality Inventory (MMPI). When these three indicators were in agreement, the diagnosis was considered "settled" (decided). In the event of a discrepancy in PTSD diagnosis among the three indicators, information from the study's other PTSD indicators was used to resolve the discrepancy. Information from these other indicators was combined statistically to create two additional main indicators for use in resolving discrepancies [Details of the logic underlying the composite diagnosis procedure and of its relationship to other potential methods of case determination are provided in Appendix B]. Application of this procedure resulted in a composite PTSD diagnosis for every subject in the clinical subsample. At least three primary indicators concurred in the composite diagnosis for every subject[1]. In fact, for 87 percent of clinical subsample respondents four out of five primary indicators agreed on the diagnosis (including 59 percent for whom all five agreed), and for the remaining 13 percent three out of five agreed.

1--For two subjects (less than one half of one percent of the total) only two indicators were available. These were settled by adjudication.

IV. NVVRS PTSD PREVALENCE ESTIMATES

A. Formulation of Prevalence Estimates

The design of the NVVRS incorporated multiple methods for making PTSD prevalence estimates. Detailed results from several alternative methods, and the convergence among the findings, are described in Appendix C. Based on an evaluation of the findings, population prevalence estimates for the projected clinical DSM-III-R diagnosis and the projected composite diagnosis will be presented. These are estimates of the current prevalence of PTSD--i.e., estimates of the number of veterans who have the disorder today. NVVRS estimates of the lifetime prevalence of PTSD--i.e., estimates of the number of veterans who ever had PTSD--will be included in a subsequent report.

B. National Estimates of Current PTSD Prevalence

Exhibit IV-1 shows the estimated current PTSD prevalence rates and corresponding estimated numbers of current PTSD cases for selected Vietnam Theater veteran subgroups from the two estimation methods. It is estimated that 15 percent (±2.6 percent) of all male theater veterans are current cases of PTSD. This represents about 470,000 of the estimated 3.14 million men who served in the Vietnam theater. Among females, the prevalence is estimated to be 9 percent (±2.8 percent) of the estimated 7,166 women who served, or about 650 current cases.

Examination of the findings for racial/ethnic subgroups of male Vietnam theater veterans indicates that the prevalence for white/others is about 14 percent (±3.0 percent), while for blacks the prevalence is 19 percent (±4.5 percent) and for Hispanics as high as 27 percent (±7.0 percent). These observed differences in racial/ethnic subgroup prevalence rates will be examined in detail in a subsequent report to determine the extent to which they may be explained by group differences in other characteristics, such as exposure to war zone stress or other trauma, socioeconomic status, etc.

Exhibit IV-1

NVVRS Estimates of Current Prevalence and Number of Current PTSD Cases Among Vietnam Theater Veteran Subgroups

Theater Veteran Subgroup	Projected Clinical DSM-III-R PTSD Prevalence Estimate	Estimated Number of Current PTSD Cases	Projected Composite PTSD Prevalence Estimate	Estimated Number of Current PTSD Cases
Males	14.7 (±2.6)	463,000	15.3 (±2.6)	481,000
Black	19.4 (±4.5)	68,000	19.3 (±4.4)	68,000
Hispanic	23.2 (±6.5)	39,000	30.9 (±7.5)	52,000
White/other	13.6 (±3.0)	356,000	13.8 (±3.0)	361,000
High war zone stress exposure	30.8 (±6.3)	245,000	38.7 (±6.8)	308,000
Low/mod. war zone stress exposure	9.3 (±2.6)	218,000	7.5 (±2.4)	173,000
Females	8.3 (±2.7)	595	10.0 (±2.9)	716
High war zone stress exposure	13.8 (±5.4)	395	20.4 (±6.2)	582
Low/mod. war zone stress exposure	4.7 (±2.6)	200	3.1 (±1.6)	134
CDC/VES subpopulation	15.2 (±4.2)		15.5 (±4.1)	

Note: Numbers in parentheses below each estimate represents the 95 percent confidence interval for the estimate.

The exhibit also shows rates of PTSD by level of war zone stressor exposure. The NVVRS measure of war zone stressor exposure was developed independently for males and females using the same methodology, and is a summary measure representing exposure to both direct combat (e.g., direct engagement of the enemy, exposure to enemy fire) and other war zone stressors (e.g., exposure to death and dying, exposure to environmental hazards). Details of the derivation of this measure and evidence for its validity are provided in Appendix D.

The NVVRS findings show that for both male and female Vietnam veterans, those exposed to higher levels of war zone stress have higher rates of PTSD today. The PTSD prevalence rate for both males and females with high exposure to war zone stress is three to five times higher than that for their counterparts with moderate or low exposure.

Finally, the NVVRS estimate of the current prevalence of PTSD in the subset of male theater veterans that was studied by the Centers for Disease Control (CDC) in the Vietnam Experience Study (VES) is just over 15 percent (±4.1 percent). A detailed discussion of this subgroup and the differences between the NVVRS and VES estimates is provided in Chapter V.

C. Case Examples

To illustrate how the prevalence rate translates into individual human terms, several case examples were drawn from the NSVG theater veteran sample. These cases were ones for which all five of the primary indicators of PTSD were positive; there is no disagreement that these are cases. The selection of the cases was based on two factors: (a) each was judged by the research team clinicians to embody the hallmark features of PTSD in theater veterans, as well as (b) being sufficiently typical that even with changes made for the purposes of disguising individual identities, the essential attributes of the disorder and their impact on work and interpersonal functioning was recognizably retained. Regarding the three individuals on whom the case descriptions were based, the core of each was a real veteran who participated in the survey and clinical interviews. A number of specific details and identifying data were changed (including the initials) so that the descriptions as presented preserve the confidentiality and anonymity of the respondents while retaining the richness and vividness of his or her individual human experience.

1. Example Case 1

J.S., an Hispanic male veteran in his late thirties, has been married for almost twenty years, has three children, and works as a semi-skilled laborer. He lives in a large metropolitan area in the northeast. He is the eldest of four children, and grew up in a poor but stable and supportive family environment. He was drafted into the US Army in 1966 and served one tour of duty in Vietnam, ending in 1968.

His primary duty was reconnaissance in an infantry unit. He experienced high and sustained warzone stressor exposure; he walked point, was frequently under fire, witnessed the death and injury of close buddies, witnessed the mutilation of the bodies of American troops, and was wounded in combat. He received several decorations including the purple heart.

J.S. reports that his experience in Vietnam matured him, but that he had difficulty coping and began to drink heavily for the first time during his tour. On his return to civilian life his problems with alcohol intensified; he was treated medically for alcohol-related pancreatic disease several years after his return. Alcohol abuse remains a serious problem to the present time.

With respect to the psychological impact of the war, he reported "I developed a nasty temper, became very nervous, and have bad dreams that take me back into the war, like it's happening all over--then I can't get back to sleep". When reminded of the war he becomes upset and vividly imagines the sights and smells of the battle field, including the discovery of bodies that had been left for several days in the jungle heat. He describes himself as frightened by his urges, easily startled, frequently on guard for no reason, emotionally withdrawn, and using alcohol to help forget about his wartime memories. His wife concurs, reporting that he has frequent nightmares, becomes enraged over minor irritations, avoids reminders of the war, and is reluctant to be emotionally close. He says he is fortunate that his wife continues to be supportive, despite his volatility and withdrawal.

He has managed to maintain steady employment and finds satisfaction in his relationship with his children. At present he is most troubled by nightmares, intrusive reliving of painful war memories, alcohol abuse, flashes of temper, difficulty opening up to his wife, and bad nerves as he

is frequently on guard, easily startled, has difficulty concentrating, and sleeps poorly.

He has never been treated for emotional problems. He has intermittently received treatment for alcohol abuse, but his drinking problems have not been addressed in the context of his overall post-war psychological adjustment problems.

2. Example Case 2

T.L. is a 38 year old black male living in a primarily blue-collar, working-class suburb of a major city. He has worked for a municipal airport for nearly 15 years, and has been married to his second wife for more than 10 years. T. L.'s parents separated when he was 12 years old, and he and three siblings were raised by his mother in an inner city neighborhood, which he described as "rather poor." He indicated that his relationship with his mother was "good", and that there was no known history of mental illness in his family of origin. Soon after graduating from high school in 1967 he enlisted into the United States Marine Corps.

From early 1968 to early 1969, T.L. served with the US Marine Corps in the Republic of Vietnam, primarily in the vicinity of the DMZ. He reported heavy combat exposure ("daily encounters with booby traps, a lot of firefights"), as well as the experience of multiple combat trauma. At one point in the NVVRS interview, T.L. described his experience in Vietnam in the following way. "It seemed like every time I turned around someone was getting shot, or had a limb blown off, or their guts hanging out. There was nothing that you could do for them." He described one of many specific traumatic incidents in these words: "One time on a mission, a land mine exploded. Three guys were killed ... blown up ... guys on the ground, screaming." T.L.'s voice faded to a barely audible whisper as he described this event to the NVVRS interviewer.

T.L. reported that severe and persistent problems in his daily functioning began within a few months of his return from Vietnam to the United States. From 1970 to the present, he has been plagued relentlessly by symptoms of post-traumatic stress disorder, the impact of which he has attempted to mollify through chronic substance abuse. He painfully acknowledged the continuing presence of distressing, intrusive memories of

death and dying in the combat zone ("Sometimes my thoughts take me right back to what happened to guys there. I wish I could have helped them."). In a voice choked with emotion, he said that he currently attempts to avoid thoughts and reminders of Vietnam, but with little success. "I try (to avoid), but it's hard. In my job I deal with the public and it seems like someone or something is always bringing it up." He also clearly described several discrete episodes during which specific, intrusive, traumatic memories of Vietnam overwhelmed his capacity to cope, precipitating what he described as "nervous breakdowns". These episodes were principally characterized by gut-wrenching pangs of guilt, shame, and despair related to the traumatic memories, persistent agitation and sleep disturbance, and desperate attempts to escape and avoid through social withdrawal and alcohol binges. During these periods of debilitating PTSD symptomatology, T.L. consulted his family physician, asking for pills for his unspecified "nerves." At the time of the NVVRS interviews, T.L. was found to meet diagnostic criteria for severe combat-related PTSD, yet he had not been under any physician's care for almost two years. Moreover, he had never sought help for PTSD and associated symptoms of distress from any mental health professional or from the Veterans Administration.

3. Example Case 3

This currently unmarried Vietnam veteran living in a large metropolitan area was in her late forties at the time of her participation in the study. She was in the service for more than 15 years and received numerous decorations and commendations. She was one of six children raised by both parents in a happy home. She was trained as a nurse and enlisted in the Air Force because it "sounded interesting."

B.R. volunteered for duty in Vietnam and served one tour in 1966-67 as a nurse, primarily caring for wounded soldiers in the area of her nursing expertise. Periodically, however, she was assigned to care for patients with injuries or trauma that required expertise outside of her primary area of skills. These episodes were very stressful; sometimes they involved supportive care of obviously terminal patients. She was exposed to mortars infrequently, but when shelling occurred it was always totally unexpected and B.R. found these frightening.

She experienced the death of several people with whom she had developed deep attachments--both professionally and personally. Her account of her reactions to these mounting losses was a gnawing lack of time and privacy to mourn because of the exhausting and grinding nursing care she was asked to and willing agreed to provide. She described her Vietnam service as both the most exciting part of her Air Force career as well as the most distressing, damaging, and traumatic. B.R. recounted that she felt it was especially hard for her to deal with the experiences of what she felt were pointless deaths and injuries and the denial of impending death by those who were terminally injured.

Her return from Vietnam was distressing--she was ostracized, shouted at, and felt ashamed, though she continued her military service. She received commendations for her post-Vietnam service, and reported few psychological signs or symptoms of upset during the span of 10-15 years prior to her return to civilian life. She did report, however, a persistent sense of distance and social withdrawal, though she did not seem to connect these to her service in Vietnam during that period.

It was only upon her return to civilian life and her selection of a job that exposed her daily to people dealing with their own traumas, past and present, that her functioning began to deteriorate. B.R. became increasingly withdrawn, irritable, and depressed. She began to have intrusive thoughts about her war experiences, and began awakening in early morning from dreams of her time in country. She could not concentrate, was jumpy and easily startled, felt numb inside, and was prone to angry outbursts.

She felt that no one could understand how she felt and that she was not able to feel close to anyone. Though she desired closer contact with both men and women, B.R. was unable to reach out or trust enough to get closer. Her episode of Post-traumatic Stress Disorder was a clear case of delayed-onset PTSD; most symptoms began well over a decade after the trauma.

Because both her work and interpersonal functioning were impeded, she was encouraged to seek treatment which she reluctantly did. Though finding the treatment program she selected in the VA system helpful, she is aware that her recovery will be a long process because she now sees that she has buried and avoided a number of powerfully painful feelings for a long time and that it will take time to deal with each one in turn.

V. COMPARISON OF THE NVVRS WITH THE CDC VIETNAM EXPERIENCE STUDY

A. Background

Prior to the initiation of the NVVRS, no previous research had been completed that would support the derivation of population-based, diagnostic estimates of the prevalence of PTSD among Vietnam veterans. In part, this was due to the absence of any official diagnostic criteria of PTSD prior to the publication of the third edition of the Diagnostic and Statistical Manual (DSM-III) by the American Psychiatric Association in 1980. As a result, studies published prior to 1980 were forced to employ more general conceptions of the symptoms of this disorder.

Immediately after the appearance of the criteria, the only instrumentation available to researchers for measuring the criteria were understandably lacking in polish and precision. Thus, even though some early estimates of the prevalence of problems of stress, adjustment, and mental health among Vietnam veterans were available, based as they were on expert opinion and clinical samples (e.g. Mantell & Pilisuk, 1975; Schindler, 1980; Walker, 1981; Walker & Cavenar, 1982; Wilson, 1980), the relationship of these projections to the prevalence of post-traumatic stress disorder defined by the nomenclature could still not be assessed. Similarly, estimates developed by three major surveys conducted during this period that involved broader and more representative samples of Vietnam veterans (Card, 1983; Egendorf et al., 1981; Fischer et al., 1980) were similarly hampered by an inability to link measures of "mental or emotional problems" or "stress" to the diagnostic criteria of PTSD.

One of the first advances in this domain was the development of a questionnaire module to assess PTSD for the Diagnostic Interview Schedule (DIS; Robins et al., 1981), a highly structured survey interview instrument designed explicitly for use by lay interviewers (i.e., nonclinicians). The DIS was originally developed by Washington University in St. Louis under the auspices of the National Institute of Mental Health for use in a landmark study of the mental health of community and institutionalized respondents in the United States--the five site Epidemiologic Catchment

Area (ECA) project. The DIS comprises multiple modules, each designed to detect the presence of a different psychiatric disorder according to one of several diagnostic systems, including DSM-III. The PTSD module was developed only after the ECA studies were underway and was used only during the second wave of interviewing (one year after the first). Slightly different versions of this module were used by the St. Louis and the North Carolina ECA sites; the Los Angeles ECA site employed a version with considerably more differences. Moreover, because it was added at a later date, the PTSD module was not included in the validation studies of the other DIS modules.

Although no estimates of the prevalence of PTSD have yet been published based on data from either the North Carolina or Los Angeles ECA sites, Helzer and his colleagues (1988) recently reported such an estimate from the St. Louis ECA data based on the 64 Vietnam veterans in their sample. They indicated a lifetime (ever had) prevalence rate of 6.25 percent for combat-related PTSD, in comparison with a 1 percent lifetime rate for any PTSD for the total population. Because of the small size and geographically limited nature of their sample, the estimates cannot be taken seriously as either general or reliable estimates of the prevalence of PTSD in the population of for Vietnam veterans.

The recently published study by the Centers for Disease Control (CDC, 1988) is not subject to the same sample-based restrictions. The CDC Vietnam Experience Study (VES) is by far the largest, most representative, and sophisticated research project to date to report on the psychological status of Vietnam veterans. A random subsample of 2,490 Vietnam veterans was selected from a larger sample of 7,924 who had entered the U.S. Army between 1965 and 1971. Using a slightly modified version of of the PTSD module of Version IIIA of the DIS, the CDC research team estimated that approximately 15 percent of these veterans had experienced combat-related PTSD at some time during or after their military service, but that the prevalence of the disorder during the one month immediately prior to the assessment was 2.2 percent. This 2.2 estimate based on the VES stands in stark contrast to the estimate of 15 percent for current prevalence of PTSD derived from the NVVRS and reported in Chapter IV.

Because both of these estimates are based on large samples of Vietnam veterans (in fact a quite similar sampling scheme was utilized by both) and conducted according to high scientific standards, a discrepancy in the estimates of the magnitude found is cause for considerable concern. Such a difference requires thoughtful and careful consideration and it is of great importance to achieve an understanding of the reasons underlying this difference. In the remainder of this chapter we describe in some detail several activities undertaken by the NVVRS research team in an effort to account for this difference and to understand how it may have occurred.

B. Differences in Samples

The CDC Vietnam Experience Study sample was selected from military personnel records from a random sample of male U.S. Army veterans who served during the Vietnam era. To increase comparability between those who served in Vietnam and those who served elsewhere, the sample was restricted to those who (1) entered military service for the first time between January 1965 and December 1971; (2) served only one term of enlistment; (3) had at least 16 weeks of active service; (4) earned a military occupational specialty other than "trainee" or "duty soldier;" and (5) had a pay grade no higher than E-5 (sergeant) when discharged from active duty.

As noted in Chapter I, the NVVRS sample was also drawn from military records, but was drawn to represent all veterans serving on active duty during the Vietnam era, excluding only those still on active duty. Since the methodology used to draw these two samples was quite similar and the population represented by the VES sample is a logical subset of the NVVRS target population, it was possible to isolate this subsample in the NVVRS data set. We did this by using the CDC sample selection criteria described above to identify "VES eligibles." To ensure the accuracy of this procedure in representing the VES target population, these criteria were assessed independently on both the military records and interview data for each NVVRS respondent. Any discrepancies that were identified between these two sources of data were examined and resolved by examination of all available data.

This procedure resulted in the identification of 484 male Vietnam theater veterans meeting the CDC VES criteria, representing an estimated 35.9 percent (weighted) of the total male Vietnam theater veteran population interviewed in the NVVRS. Given the nature and relative proportion of this subsample, there exists a strong potential for substantial differences in demographic and/or psychosocial characteristics between the VES-matched subsample and the total NVVRS sample of male theater veterans. However, other than some obvious differences on factors related directly to the selection criteria (e.g., dates of entry to active duty, dates of separation, months of active duty, pay grade at discharge) surprisingly few differences were found between this subsample and the total NVVRS sample of male theater veterans. The NVVRS matched-VES subsample is much younger and much more likely to have been drafted than the total NVVRS male theater veteran sample, as well as somewhat more likely to live in the North Central States (less in the West) and is less likely to have entered the military from a medium-sized city. No significant differences were evident, however, for such characteristics as race, ethnicity, education, AFQT scores, or receipt of an Article 15. Consistent with these "demographic" characteristics, the proportion of men in the matched-VES subsample who scored above the designated diagnostic cutoff on the NVVRS M-PTSD measure was 23 percent compared to 20.9 percent for the total NVVRS male theater veteran sample.

When the NVVRS criteria and methods for deriving a diagnosis of PTSD were applied to the matched-VES subsample, the estimated current prevalence rate is 15.2 percent for the projected clinical DSM-III-R diagnosis and 15.6 for the projected composite diagnosis. These rates are remarkably similar to the estimates in Chapter IV for the full population of male Vietnam theater veterans (14.7 and 15.3, respectively). Thus, the difference observed in current prevalence estimates between the CDC Vietnam Experience Study and the NVVRS does not appear to reflect differences in the populations sampled even though the two populations are quite different on some military characteristics.

C. Differences in Instrumentation and Methodology

Given the absence of observed differences between the CDC and NVVRS samples, differences in the measures and methods used to generate the diagnosis of PTSD appear to be the most likely alternative explanation of the discrepancy in the rates of current prevalence of PTSD between the two studies.

As described in Chapter III, the NVVRS employed a multiple methods approach to the assessment of symptoms of PTSD. The derivation of diagnoses was based on DSM-III-R criteria (the criteria currently in use by the Veterans Administration and the standard in use across the country by mental health clinicians to diagnose this disorder). By contrast, the CDC study employed a slightly revised version of the DIS Version III-A PTSD Module and established diagnoses of PTSD based on the no longer current criteria elaborated in DSM-III.

The NVVRS approach is clearly both more comprehensive as well as more complex than that used by the CDC. It is based on the convergence of a set of survey and clinical measures of established validity with the added refinement of clinical review and adjudication of the most diagnostically ambiguous cases (i.e., cases where the multiple measures diverge). The CDC methodology is based on the PTSD module of the DIS whose capacity to distinguish true cases of PTSD from noncases has still not been established.

It is important to note, however, that because the DIS has been widely regarded as the "state of the art" for the assessment of psychiatric disorder and derivation of estimates of incidence and prevalence of diagnoses from survey data, the NVVRS study team felt it vital to include a version of the DIS in the survey. As a consequence, the DIS, including a modified PTSD module, is a significant component of the NVVRS instrumentation.

The choice of the particular DIS PTSD module was not straightforward, however, for several reasons. There were several versions in existence at the time the NVVRS instrumentation was being selected, although none had been validated. The diagnostic criteria for PTSD were in transition from DSM-III to DSM-III-R. The research team grappled with this choice by

consulting with a nationally-recognized panel of expert clinicians. Together, they developed detailed guidelines for a new module for the diagnostic assessment of PTSD, with a style and format consistent with other DIS modules. This new "DIS-type" measure would be able to assess symptoms of PTSD using either DSM-III and DSM-III-R criteria, as well as addressing concerns raised by these experts about versions of the PTSD module of the DIS in use at that time (including the St. Louis and North Carolina versions). The resulting "DIS-type" PTSD measure was then included as one of several measures in the Validation Study described in Chapter III and Appendix A. As shown in Appendix A (Exhibit A-3), in the "treatment-seeking" sample (i.e., Vet Center and VA Medical Center patients) used for the Validation Study, this modified and revised PTSD module performed sufficiently well in distinguishing cases from noncases to be carried forward to the main NSVG study. The module attained a sensitivity of 87.2, a specificity of 72.6, and a Kappa = .639 with the certified clinical diagnosis.

1. PTSD Prevalence Estimates Based on the NVVRS DIS-Based Type

Using the modified DIS-type instrument and the associated scoring algorithms developed and evaluated in the Validation Study, several estimates of the prevalence of PTSD were developed based on the full NSVG sample. First, because of the transition of the official nomenclature from DSM-III to DSM-III-R during the study period, estimates were computed using both sets of criteria. Second, because the majority of published studies from the ECA project on the prevalence of psychiatric disorders other than PTSD employed a six month cut-off for current prevalence, and because expert clinicians involved in the NVVRS felt that using a six month, as opposed to one month, time frame more effectively captured the clinical phenomenology of the waxing and waning of intrusive and avoidant symptoms in relation to current stressors, estimates of current prevalence of PTSD were computed using a six month cut-off. For purposes of comparison with other studies, including the St. Louis ECA and CDC VES, however, we also calculated separate one month estimates using both the DSM-III and the DSM-III-R criteria. Finally, we distinguished between PTSD related to any trauma and solely combat-related PTSD.

These estimates are presented in parts I and II of Exhibit V-I, along with those from the CDC Vietnam Experience Study. From this table it is evident that the NVVRS estimates using the DIS-type instrument and the DSM-III criteria are very similar to those reported by the CDC. The lifetime prevalence rate is 14.9 percent, and the current one month prevalence rate is 3.9 percent. Though the current prevalence rate is almost twice the rate reported in the CDC VES, it is far closer to 2.2 than it is to the 15.3 percent NVVRS current prevalence rate using the projected composite diagnosis.

An increase in the interval defining the disorder from one to six months increases this estimate by 50 percent, from 4 to 6 percent. Both the application of the DSM-III criteria as well as the restriction to combat-related PTSD only results in a decrease of the current estimate to as low as 3.3 percent, though the general pattern remains: using the DIS-type measure developed for the NVVRS results in estimates of current PTSD prevalence substantially consistent with those reported by the CDC and closer to those of the CDC than to those that obtained using the full instrumentation and diagnostic methodology of the NVVRS.

2. Estimates of PTSD Prevalence Based on Matching NVVRS DIS-Type Instrumentation and Procedures to those used by the CDC

In addition to the difference between the CDC VES and NVVRS samples described above, the two studies differed in their instrumentation in important ways. The DIS-type instrument used in the NVVRS as well as the scoring algorithm are materially different from those of the CDC. Given this consideration, we felt it necessary to further explore similarities and differences in the estimates of PTSD prevalence derived from these studies. As a result, the research team used the NVVRS study data to conduct a set of analyses designed to simulate as closely as possible the instrumentation and scoring procedures used by the CDC VES. The estimates derived from these analyses included some that were restricted to the NVVRS matched-VES subsample described previously.

The NVVRS DIS-type PTSD measure employed multiple items for the various DSM-III and DSM-III-R subcriteria, whereas the CDC measure had no

more than one item for each diagnostic subcriterion. Consequently, it was possible to construct a "CDC-matched" DIS-based measure. To do so, the best matching single NVVRS item was selected for each CDC criterion item. (See Exhibit E-1 in Appendix E for a comparison of items from the CDC DIS with those from the NVVRS DIS-type module). Substantively, the match was very close, with the only really poor "fit" occurring on subcriterion D6--intensification of symptoms in situations reminiscent of the traumatic event. The CDC item asked directly whether the respondent had experienced this phenomenon. The NVVRS DIS-type measure approached measurement of this criterion differently. Respondents were asked if anxiety symptoms that they had reported earlier in the interview had ever occurred because they had been reminded of a traumatic event.

Other criteria had less than identical matches. The NVVRS item "disturbing memories" was used to match the CDC item "remember horrible things." "Found it difficult to feel close to other people" in the NVVRS survey was used as a match for the CDC item "less ability to care about others". An NVVRS item inquired about "difficulty falling asleep" while the CDC inquired about "trouble sleeping (falling asleep, staying asleep, not able to sleep)." Finally the CDC item "ashamed of being alive" was assessed in the NVVRS by asking if respondents "felt guilt."

In addition to matching items, the scoring algorithm and decision rules for making the diagnosis of PTSD used by the CDC was simulated very closely for the NVVRS data. It was possible to replicate this procedure reasonably well. Both the CDC and NVVRS simulation of these procedures (1) used DSM-III criteria; (2) did not use any DSM-III diagnostic exclusion criteria; (3) did not require the respondent to meet any test of severity for either individual items or the total disorder; (4) included only a combat-related traumatic event; and (5) used the one month cut-off for establishing current prevalence.

There were two major differences between the CDC procedures and the NVVRS simulation. First, the NVVRS DIS-type survey instrument required linkage of symptoms to the traumatic event only for the intrusive symptom criteria (the "B" criteria of the DSM-III), whereas the CDC procedure required linkage for all criterion items. Second, the CDC procedure asked respondents only if they had ever had any particular symptom. The NVVRS

DIS-type instrument not only asked if respondents had ever had a criterion symptom but also whether it was present for a week or more. In the NVVRS simulation, these two differences would tend to have opposite effects (i.e., one would tend to produce higher rates the other lower rates). Though the simulation was not perfect, it was reasonably similar to the CDC procedure.

The results of the simulation, including a restriction to the matched-VES subsample, are presented in the last panel of Exhibit V-I (Part III). Application of the simulation procedures to the full NVVRS sample of male Vietnam theater veterans resulted in a one-month current prevalence estimate for PTSD of 2.1 percent, virtually identical to the CDC's own estimate of 2.2 percent (Part IA of the same exhibit). In contrast, the lifetime prevalence estimate of 7.1 percent is considerably lower (less than half of) than the CDC estimate. When the simulation procedure was applied to the NVVRS matched-VES subsample only, the subsample directly comparable to the VES sample, the lifetime prevalence estimate increased only slightly--to 7.8 percent--while the one-month current prevalence estimate decreased slightly--to 1.4 percent.

What these results demonstrate is that when a CDC-matched instrument and scoring procedure are utilized with NVVRS data the estimates of current prevalence are statistically indistinguishable from those published by the CDC Vietnam Experience Study, though the simulated lifetime prevalence estimates are substantially lower than the CDC's. Moreover, consistent with our discussion of the similarities of the samples, estimates derived from the ostensibly quite atypical CDC population do not differ much from those for the total population of men serving in the Vietnam theater of operations.

3. Validity of the NVVRS Estimates Based on DIS-Type Instrumentation

The findings of the analyses using the simulation procedures indicate that the estimates of current prevalence of PTSD from the NVVRS using a DIS-type PTSD module result in figures substantially closer to those reported by the CDC than tc those derived from the other NVVRS measures. In combination with the consistently observed absence of differences

between the matched-VES subsample and the full NVVRS sample of male theater veterans, these observations suggest that the dramatic differences in estimates of current prevalence of PTSD from the CDC and the NVVRS are predominantly (if not exclusively) due to differences in instrumentation rather than samples. The differences in the DIS-like measures and algorithms used in the two studies are substantial enough, however, to prevent this from being stated with full certainty.

Given these differences, the single remaining important question is the extent to which these divergent estimates are based on equally valid criteria and methods. The Validation Study conducted prior to the NSVG had shown that the NVVRS DIS-type PTSD module performed relatively well in distinguishing cases of current PTSD from noncases in treatment-seeking veterans. The measure performed sufficiently well to be included in the national survey. Nonetheless, as discussed in Chapter III, the national survey component of the NVVRS predominantly involved the assessment of PTSD in a community sample, rather than a treatment-seeking sample, and the research literature suggests that relationships between diagnostic measures and "true" diagnoses (i.e. the validity of such measures) tend to decline somewhat in moving from treatment-seeking to general (community) populations. Thus, the NVVRS felt it important to field a clinical follow-up subsample component which would allow a further examination of the validity of its measures in the general population of (non-treatment-seeking) veterans.

As described in Chapter III and Appendix B, each of the PTSD measures used in the NVVRS was examined in relation to two standards of "caseness" derived from the clinical subsample (all of whom were interviewed by an expert clinician). In contrast to the relationships observed in the Validation Study, diagnoses generated by the NVVRS DIS-type measure did not do well in distinguishing cases from noncases in our clinical follow-up subsample. In contrast to its sensitivity of 87.2, specificity of 72.6 and Kappa of .639 in the Validation Study, it exhibited a sensitivity of only 21.5, specificity of 97.9 and Kappa of .256. (Comparable concordance estimates with the Composite PTSD diagnosis were 22.7, 99.5, and .285, respectively.) Thus, while this measure was quite successful in correctly identifying noncases, it was able to identify only 22-23 percent of the

cases of PTSD as diagnosed either by the expert clinician or by multiple indicators, a level of sensitivity to PTSD caseness far below acceptable levels. In comparison to the other measures presented in Exhibits B-5 and B-6, the sensitivity and Kappa (i.e., measure of agreement between two measures adjusted for chance) for this measure were far worse. For example, the M-PTSD, the other survey-based measure carried forward from the Validation Study, exhibited a sensitivity of 77.3, specificity of 82.8 and Kappa of .528 in relation to the DSM-III-R clinical diagnosis, and 82.4, 86.8, and .644, respectively, in relation to the composite PTSD diagnosis.

Similar measures of concordance were computed for the diagnoses generated by the instrumentation and algorithms used to simulate the CDC methodology using the DIS-type measures in the NVVRS, with even more sobering results. While this simulated measure correctly identified as PTSD-positive 100% of the noncases as noncases (i.e., specificity of 100.0), it correctly identified less than 12 percent of the cases identified by the composite PTSD diagnosis, for a Kappa of only .160. (Estimates using the DSM-III-R clinical diagnosis are virtually identical.) Although the poorer performance of the latter may result in part because the composite measure is calibrated against DSM-III-R rather than DSM-III criteria, the effect of this should be relatively minor. In fact, because the DSM-III-R criteria are somewhat more stringent than those of DSM-III, it might be expected that the CDC-simulated diagnosis would tend to have a somewhat lower specificity and higher sensitivity than the NVVRS DIS-type measure based on DSM-III-R criteria.

D. Conclusions

Our analysis of the various factors that could account for the differences in prevalence rates between the CDC and NVVRS studies suggest that the difference is primarily the result of differences in the measures used to assess PTSD. Diagnoses derived from all of the DIS-type algorithms produce lower prevalence estimates than the current NVVRS estimates of 15 percent. The low sensitivity exhibited by the DIS type diagnoses suggests that the lower estimates derived from these DIS-type measures are a result

of a tendency to miss "true" cases of the disorder and thereby underestimate true prevalence. (Although the reasons for this inability to detect PTSD cases are not entirely clear, some thoughts about why this might be the case are presented in Appendix E.) Prevalence estimates developed from the NVVRS DSM-III-R clinical and composite methods on the VES-matched sample are both 15 percent. For the VES-matched sample using the M-PTSD measure, it is 23 percent. These are substantially the same as those obtained on the total NVVRS sample of male theater veterans. This suggests that the study population characteristics and interviewing procedures probably do not account for the overall differences observed in PTSD prevalence. Although the evidence is not complete, in our opinion it is quite compelling, and it appears that the low estimates derived from the CDC Vietnam Experience Study result primarily from their reliance on an instrument that is not sufficiently sensitive to detect true PTSD cases in a community population.

Exhibit V-1

CDC DIS PTSD Prevalence Estimates
and Analogous NVVRS DIS-Type Estimates[1]

I. ORIGINAL CDC DATA	
A. Current (one month)	2.2
B. Lifetime	14.7
II. NVVRS DIS DATA	
A. DSM-III Criteria	
1. Current (one month)	3.9
2. Current (six month)	6.0
3. Lifetime	14.9
B. DSM-III-R Criteria	
1. Current (one month)	3.5
2. Current (six month)	4.7
3. Lifetime	12.0
C. Specific Combat Related Only	
1. DSM-III Criteria	
(a) Current (one month)	3.7
(b) Current (six month)	5.4
(c) Lifetime	12.4
2. DSM-III-R Criteria	
(a) Current (one month)	3.3
(b) Current (six month)	4.2
(c) Lifetime	9.6
III. NVVRS DATA CDC SCORING ALGORITHM (DSM-III Criteria and Specific Combat Related Only)	
A. All NVVRS Theater Veterans	
a. Current (one month)	2.1
b. Lifetime	7.1
B. CDC Matched Subsample	
a. Current (one month)	1.4
b. Lifetime	7.8

[1]The NVVRS DIS-Type estimates are not those used by, and are not equivalent to, the NVVRS prevalence estimates of PTSD provided in Chapter IV.