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Corporate Author	School of Public Health, Columbia University, and the N
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Columbia University — American Legion

VIETNAM VETERANS STUDY

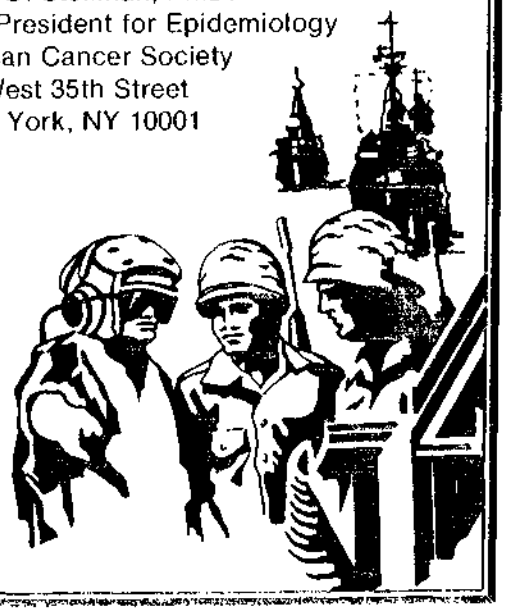
Sponsored by The American Legion

In Cooperation with

Jeanne M. Stellman, Ph.D.
School of Public Health
Columbia University
600 West 168th Street
New York, NY 10032

and

Steven D. Stellman, Ph.D.
Assistant Vice-President for Epidemiology
American Cancer Society
4 West 35th Street
New York, NY 10001



REPORT #1
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COLUMBIA UNIVERSITY — AMERICAN LEGION VIETNAM VETERANS STUDY

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Jeanne M. Stellman, Ph.D.
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Assistant Vice-President for Epidemiology
American Cancer Society
4 West 35th Street
New York, NY 10001

National Veterans Affairs and Rehabilitation Commission
The American Legion
1608 K Street NW
Washington, DC 20006

SUMMARY

The first report to The American Legion describes the basic hypotheses, specific aims and design of The Columbia University — American Legion Vietnam Veterans study of a randomly selected population of almost 7,000 Legionnaires who served during the Vietnam War. The report describes the training and the efforts of the nearly 1,000 American Legion volunteers in soliciting the cooperation of their fellow Legionnaires in the survey.

Demographic analysis of the participants, approximately 40% of whom served in Southeast Asia, is given. The group is fairly homogeneous: white, the majority with family incomes in the $25,000 and up range. The great majority have completed high school, technical school or some college. They are an overwhelmingly married group, with more than 75% married only one time.

Although a wide spectrum of years of birth is represented, the men born between the years 1944 and 1949 were the group with the largest percentage serving in Southeast Asia, and using a scale for measuring combat condition exposure, this was also the group that experienced the most demanding conditions of war. Most of the men served an average of three years.

Most of the study participants joined The American Legion for social reasons: a place to get together, contact with friends and relatives. Some 18% appeared to join primarily for patriotic reasons. Only a very small percentage joined because of a "problem," important data for ascertaining potential sources of bias in this group. Complaints and health problems are clearly not the major reason for membership in The American Legion.

Among the interesting and important findings of this phase of the study are the following:

1. Within the study population educational attainment is not related to exposure to combat conditions.
2. As in the general population, income and educational attainment are highly correlated.
3. However, when age and educational attainment are taken into account, exposure to intense combat conditions exerts a major independent effect on annual family income. We estimate that among men born in the years 1944-1949 with the most intense combat exposure, mean annual income levels appear to be $3,000-$4,000 less than men of their same age group without the exposure.
4. Exposure to intense combat conditions was also found to have an effect on marital status. Men who experienced intense combat conditions have a divorce rate significantly higher than other men who served in Southeast Asia in other conditions or who served elsewhere.
5. Direct measures of general happiness and satisfaction and reports of general health are significantly worse for men who served under the heavy combat conditions. The strongest differences were observed among men born in the years 1944-1949.
6. The attitudes and perceptions of the Veterans Administration and the usage of the facilities are also analyzed and described within.

INTRODUCTION

In the latter part of 1983 The American Legion undertook the sponsorship of a study to be carried out by Dr. Jeanne M. Stellman, School of Public Health, Columbia University in collaboration with Dr. Steven D. Stellman (American Cancer Society). John F. Sommer, deputy director, National Veterans Affairs and Rehabilitation Commission, was designated The American Legion's project director. The study became designated The American Legion — Columbia University Vietnam Veterans Study.

More than 6800 completed questionnaires are on-line on the computer, having undergone a selection, editing and data cleaning and vertification process. This data set is very large with more than 600 variables on each respondent. It represents a Legion-wide effort and commitment, entailing the volunteer efforts of almost a thousand Legionnaires, and the unflagging work and dedication of many American Legion staff members, Departments and Commissions.

This report is the first of several analyses which will be submitted to The American Legion and, when appropriate, to the professional community for separate publication. Here we set out the specific aims and hypotheses of the study as originally formulated and describe the study population assembling and data collection processes. Also presented are analyses of:

1. Demographic characteristics of the respondents
2. Attitudes and perceptions and utilization of the Veterans Administration
3. Extent and intensity of combat experience by year of service and its interrelationships with family income, general happiness and satisfaction and self-appraisals of health.

Future reports will include analysis of post-traumatic stress disorder and other physical and mental health and well-being outcomes; relations, if any, between these outcomes and calculated and reported exposures to Agent Orange; and family and reproductive health and well-being of the study population. These reports will be forthcoming over the next year since they require extensive analysis, and in some cases, review by outside experts before they can be finalized.

BACKGROUND

The **specific aims** of the study were:

1. To select a random sample of Vietnam veterans from among the membership of The American Legion, approximately half with service in Southeast Asia and half without
2. To obtain and analyze demographic information on the selected sample of respondents
3. To document exposure to herbicides and traumatic military experiences among this sample of Vietnam veterans
4. To obtain and analyze information on the personal, reproductive, family, and mental health and on the lifestyles of these veterans
5. To obtain data about the feelings and attitudes of the respondents toward the Veterans Administration, and their actual experiences with its facilities and programs

The specific **hypotheses** of the study were:

(N.B. hypotheses are always given as statements to be either accepted or rejected. They are not conclusions and should not be interpreted as such.)

1. Exposure to traumatic military experiences have resulted in a measurable

increase in adverse mental, physical and social effects which have been characterized by the DSM III diagnosis for post-traumatic stress disorder. (Stress main effect)

2. Exposure to herbicides have resulted in a measurable increase in adverse health effects such as skin disorders with adult onset, signs of immunologic dysfunction, and increased incidence of adverse reproductive outcomes, in comparison to respondents with no known exposure to herbicides. (Herbicide main effect)

3. Veterans with exposure to both herbicides and traumatic military experiences will have had greater levels of adverse effects than veterans with exposure to no such exposure or to only one set of exposures (Interaction Hypotheses).

4. Vietnam veterans have positive feelings towards the Veterans Administration and are fully informed about the programs and facilities of the VA.

The study was designed to obtain data to confirm or reject these hypotheses through self-administered questionnaires distributed by a network of trained volunteers within The American Legion.

STUDY DESIGN

The study has a cross-sectional design in which various outcome measures are compared between two groups of veterans; Vietnam veterans who served in Southeast Asia and Vietnam Era veterans who did not serve in Southeast Asia. The study is restricted to male American Legion members on the membership rolls as of October 15, 1983, whose posts are located anywhere in six states: Colorado, Ohio, Maryland, Pennsylvania, Indiana and Minnesota. Analysis is based on a mailed, self-administered questionnaire designed to elicit information relevant to the stated hypotheses and specific aims of the study as stated above.

The questionnaire was distributed to a random sample of Vietnam veterans selected from the membership roster of The American Legion.

The Sampling Procedure:

Sampling was set up in such a way that each American Legion member in the first group had the same chance of being sent a questionnaire as every other member of that group, and each member of the second group had the same chance of receiving a questionnaire as every other member of his group. Both groups have a similar age distribution.

The sampling system was built around a computerized filing system patterned after The American Legion's membership system. The Legion maintains a computerized mailing system at its National Headquarters. This data base contains the following data for all members: State, Post, Name, Address, Zip Code, Dues Status, and length of membership. The Legion has recently begun to add war era (World War I, World War II, Korea, Vietnam) to members' records, but this data was available for fewer than 10% of the records.

Our intention was to obtain equal numbers of Vietnam veterans who had served in Southeast Asia (SEA) (in-country) and who had served elsewhere (in-service) during the same period. The main chore turned out to be identification of Vietnam members from the membership rolls, and subsequently inviting a random sample of them to participate in the study.

A file containing 85,000 records was drawn at random from the membership files for the six participating Departments (states). This number was chosen to be large enough to yield sufficient Vietnam veterans for the statistical comparisons we intended to make in our later analyses. This initial file excluded those members already known to have served in other wars, whose memberships had expired, or who had been Ameri-

can Legion members for over twenty years, since the latter would have left military service before the start of the Vietnam War.

A letter was sent to each member on the list, signed by the National Commander, explaining the study and requesting cooperation. The member was asked to fill out and return an enclosed prepaid postcard, on which he could check off the war era and, if Vietnam, whether in-country or in-service. This information was entered in each member's computer record. A second round of postcards was sent after six weeks. Ultimately, about 50,000 postcards were received which indicated war era.

It was still necessary to identify the war era of the remaining men on our lists. For this purpose, volunteer "researchers" were recruited in each of the six Departments. Each researcher was given a list of 200 names of members who had not returned postcards, and had the task of determining which war they had served in (and if Vietnam, whether in-country or not). These lists were sorted in zip-code order, so that each researcher had lists of men who resided in general proximity to each other. Researchers were specially trained to obtain phone numbers and then to telephone the members. If it could be definitely ascertained that a member was not a Vietnam veteran (e.g., through post records or personal knowledge), a phone call was not necessary. Phone contact was requested in all other cases. Special efforts were required in the surprisingly large number of cases with unlisted or no telephones, including personal visits and searching of Post records.

All 12,588 men who were identified as Vietnam veterans were sent questionnaires, whether or not they indicated to the researcher a willingness to cooperate. Bias and response rate calculations are discussed in a later report.

Enrolling the study population:

A design feature of the study was to utilize the organizational structure and membership of the Legion for enrolling the cohort in the study. The assembling of the study population entailed the volunteer efforts of a Chairman in each Department, 61 research team captains and 770 American Legion "researcher volunteers" who made personal contact with fellow Legionnaires selected by the sampling procedures described below. In essence an "army" of dedicated volunteers was recruited for the work.

The structure can be schematically represented as follows:

Project Directors

Jeanne Stellman — John Sommer
Steven Stellman

Department Chairmen

Colorado	Indiana	Maryland	Minnesota	Ohio	Penn	S.D. (pre-test)
Captains	Captains	Captains	Captains	Captains	Captains	Captain

Researcher Volunteers
Researcher Volunteers
Researcher Volunteers
Researcher Volunteers
Researcher Volunteers

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•

The role of the Department Chairman was to be the coordinator of the study in the Department and to work closely with the study team in all aspects of data collection and publicity, including the facilitating of the training sessions and the follow-up, as well as smoothing out the inevitable problems that arise in a labor-intensive effort of this size.

In each Department Legionnaire leaders volunteered to be study Captains. Sixty-one members served in this capacity. The Captains reported directly to the Chairman. He or she was responsible for approximately 10 Researcher Volunteers. Responsibility included seeing to it that rosters were completed and returned; answering all Researcher Volunteer questions; facilitating the follow-up.

The Researcher Volunteers were charged with making personal contact, generally by telephone, with men on their roster of sampled names. Personal contact was made for two major reasons. The first was that Legion membership roster records had information on which war members had served in for only a small proportion of the total membership. Thus one purpose of the phone call was to determine whether the Legionnaire was a Vietnam Veteran and whether he had served in Southeast Asia. The second major purpose of the phone call was to establish personal contact with those selected by the sampling as part of the effort designed to enhance the response rate.

Training sessions were held in each Department to inform the participants about the nature of the study and to train them in the proper manner of contacting members. Another purpose of the training session was to answer all questions the Legion team had and to distribute the materials, such as rosters and telephone log sheets.

Training sessions also included a slide show, developed by The American Legion National Public Relations Division, which explicated the aims of the study and the "do's and don't's" of carrying out the role of a researcher volunteer.

RESULTS

1. DEMOGRAPHY — WHO THE RESPONDENTS ARE

The men who responded to The American Legion survey appear to be drawn from a solid middle segment of American society. They are an almost entirely white group (>98%) with a median family income of between $25,000–$30,000. The great majority have completed high school or technical school, almost 13% have completed college, and nearly an additional 5% have had professional or graduate education, as summarized in Table 2 below.

TABLE 1
FAMILY INCOME

	"In-Country" Southeast Asia	"In-Service" Service Elsewhere
	%	%
Missing information	1.9	2.9
Less than $6,000	3.3	3.3
$6-7,999	1.4	1.6
$8-9,999	1.8	1.7
$10-11,999	3.1	2.6
$12-13,999	4.2	3.8
$14-15,999	5.0	4.2
$16-19,999	9.3	9.9
$20-24,999	18.8	17.3
$25-29,999	16.5	15.4
$30,000 and up	34.7	37.3

TABLE 2
EDUCATIONAL ATTAINMENT

	"In-Country" Southeast Asia	"In-Service" Service Elsewhere
	%	%
Grade School	0.7	0.4
Some High School	5.4	5.2
High School	38	40.9
Some College	23	22
Vocational/Technical	15	12
College	13	12
Professional School	4.8	4.3

We have not yet coded occupation for the group, since this is a manual task, but we do have some data on potential exposures to occupational hazards on the job. About 13% of the men in the "in-country" (service in Southeast Asia) and 15% of the "in-service" (did not serve in Southeast Asia) group reported that they have developed a skin rash or allergy on the job (or in a hobby) and about 13% and 12%, respectively reported that they have at some time developed lasting nose, throat or chest irritation or discomfort on the job or in a hobby.

They also report the following specific exposures:

TABLE 3
Reported Chemical Exposures in Jobs or Hobbies

	"In-Country" Southeast Asia	"In-Service" Service Elsewhere
	%	%
Agricultural Chemicals	6.5	6.3
Solvents	20.4	23.6
Pesticides	4.5	4.3
Radiation	2.3	4.2
Chemical Fumes	23.2	29.5
Cleaning Materials	19.6	22.4
Herbicides	4.2	4.0

These data appear to indicate that at least 25% of the members may be in service or industrial jobs and at least 5% may be employed in agricultural trades. These numbers are probably underestimates since not all workers in these areas would report being exposed to such agents on the job. Hobbies, however, may account for some of the reported exposures which could lower the percentage. Respondents could have checked off more than one response in this section of the question. The question of occupation, employment and their relationships to military experience will be explored in a subsequent report.

Birth Cohorts

Most of the respondents were born between the years of 1940-1951, with the largest percentage born between 1944-1949, the years of birth producing men of draft age coinciding with the peak of the Vietnam War. Table 4 shows the distribution of years of birth of the cohort.

TABLE 4
Areas of Service During the Vietnam Era

Year of Birth	"In-Country" Southeast Asia	"In-Service" Service Elsewhere
	%	%
Before 1930	0.4	3.9
1930-1939	9.0	11.0
1940-1943	12.0	24.0
1944-1945	15.0	12.9
1946-1947	26.7	17.1
1948-1949	24.1	13.2
1950 and up	9.5	18.0

For men born between 1946 and 1949 in our sample, there were a greater number who served in the war zone than who did not. The ratio of in-country (those with Southeast Asia service) to in-service (those who served elsewhere) veterans among Legionnaires is much greater than among the general population of United States veterans, where only about one out of 4 to 5 men served in the war zone. Among the study population approximately 40% served part of their time in Southeast Asia and for men born in the peak years, among members of The American Legion, the ratio almost reaches two to one for the 1948-1949 birth cohort.

The 1946-1949 age cohort, while serving for the smallest mean number of years, is also the group that experienced the highest combat levels as measured by responses to eight questions on combat experience that had been successfully used by other researchers as one indicator of combat intensity. The questions and response scales are:

During your service in the armed forces, how often did you experience the following? (Circle the most appropriate answer)

	Never	Rarely	Sometimes	Often	Very Often
a. Fire your weapon at the enemy?	1	2	3	4	5
b. Kill the enemy?	1	2	3	4	5
c. See someone killed?	1	2	3	4	5
d. See the enemy wounded?	1	2	3	4	5
e. See our guys wounded?	1	2	3	4	5
f. See dead enemy?	1	2	3	4	5
g. See our dead?	1	2	3	4	5
h. Find yourself in a situation you thought you would never survive?	1	2	3	4	5

For the purpose of analysis we have simply created an additive scale which sums up the value of the response for each question, so that the range of responses can go from 8 to 40. The reliability of the COMBAT scale is very high with a Cronbach's alpha = 0.96. (Reliability is a statistical test applied to these additive scales.)

Combat levels are not given for in-service veterans. All analyses based on combat throughout this report are restricted to in-service veterans who responded "never" to all eight questions or answered "rarely" to an average of two questions at most (e.g. combat score is less than 10.)

Although we did not ask the question directly, it appears that a least 15% of the sample were career soldiers (age group born before 1939).

TABLE 5
Mean Years of Service and Mean Combat Levels

Year of Birth	Mean Years of Service	Mean Combat Level	Mean Years of Service
Before 1930	7.83	3.13	6.69
1930-1939	7.47	2.83	4.96
1940-1943	4.00	2.61	3.65
1944-1945	3.25	2.79	3.21
1946-1947	2.94	2.96	3.09
1948-1949	2.72	3.13	3.12
1950 and up	2.98	2.63	3.25

Why The Participants are Legionnaires: It is important to know, both for the purposes of the study and for the broader general purposes and goals of The American Legion, who the study participants are: What are their interests, their attitudes, their perceptions and their social background? We can obtain some insight into the question of "who these almost 7,000 Vietnam veterans are" from the following data.

One question that was asked of the participants in the study was for them to list the single "best" reason they had for joining The American Legion. The answers are tabulated in Table 6. We can see that both the men who served in Southeast Asia and those whose tour of duty was elsewhere have a very similar distribution of "best" reasons for joining. Most people joined the Legion through their social network. They were either recruited by a family member who was already a Legion member (about 25%) or by a friend or acquaintance (more than one-third). This means that the current membership of the Legion may represent its most powerful avenue for the recruitment of new members.

About 17% of the Legionnaires in the study joined because the Legion represented a good place for them to socialize. And, interestingly, and perhaps contrary to the public image of The American Legion, only 18%, or fewer than one in five, Vietnam veterans considered patriotism the "best" single reason they had for joining. Of importance to the study, only about 1% stated they had a special problem with which they needed Legion assistance. About 4% checked off the "other" category, but these have not been hand-coded as yet.

In any study of health and social outcomes it is of utmost importance to determine possible sources of bias. This bias might be serious if membership in the organization turns out to be closely related to the health or social outcomes under question (e.g. a surrogate variable). Since The American Legion provides certain services to its members which can affect their utilization of the Veterans Administration and perhaps ultimately their health status, it was important to ascertain whether these factors influenced their reason to join.

Examination of the data in Table 7 clearly shows that there are no material differences in reason for joining between in-country and in-service veterans. In addition, only a very small percentage joined for the specific reason of having a "problem" with which they felt the Legion could assist them.

Thus we do not believe that a selection bias exists with regard to reason for joining. We also believe this data can be a potent argument against those who posit that a "military personality" of combative people, predisposed to combat and to joining military-like organizations exists. The predominant reasons for acquiring membership in the Legion are clearly social and not militaristic.

TABLE 7
Best Reason for Joining The American Legion

	"In-Country" Southeast Asia %	"In-Service" Service Elsewhere %
1. Someone in my family was a member and encouraged me to join	25.2	23.9
2. The American Legion is a good place to socialize in my town (e.g. have a drink on the weekend)	16.5	17.7
3. I was recruited by a friend or acquaintance	34.6	35.3
4. I had some personal problems (such as with the VA) and I joined the Legion to help me work them out	1.2	0.9
5. I joined for patriotic reasons	18.0	18.6
6. Other reason: _____	4.5	3.6

Educational Attainment of Study Population: Another demographic characteristic that is important to consider and also can be used to address the issue of whether men of a certain personality or type "selected themselves" for combat, is the distribution of combat experience and service in Southeast Asia as a function of education.

When the distribution of educational attainment of all men who did not serve in Southeast Asia and who reported never being in combat-like situations is compared to those who did serve in Southeast Asia, no meaningful differences were observed. Further, when the men who served in Southeast Asia are divided into groups reporting differing levels of combat exposure, very little difference in educational attainment is again observed. Thus, if there is a "military personality" it does not seem to manifest itself in terms of educational attainment. These data also show how demographically similar the "in-service" and the "in-country" veterans are. Table 8 presents the educational attainment data.

TABLE 8
Educational Attainment And Reported Combat Exposure

	Less than High Schl	Graduated High School	Some College	Vocational/ Technical	College Grad.	Graduated Professional School
Combat Score			**Percent Distribution**			
no Southeast Asia service						
1	5.2	41.8	21.6	15.0	12.2	4.2
Served in SEA						
1	5.3	39.7	21.6	16.5	12.5	4.4
2	5.6	41.8	18.9	15.8	12.8	5.1
3	5.3	36.0	24.4	14.1	16.0	4.1

TABLE 8 (Continued)
Educational Attainment And Reported Combat Exposure

	Less than High Schl	Graduated High School	Some College	Vocational/ Technical	College Grad.	Graduated Professional School
Combat Score			**Percent Distribution**			
4	5.7	37.2	25.8	15.6	10.7	5.0
5	8.7	35.5	25.8	13.3	11.1	5.6
All SEA	6.0	38.1	23.1	15.1	12.9	4.8

Marital Status of Sample: The majority of the respondents are now in their late thirties or early forties. They are predominantly a married group.

TABLE 9
Current Marital Status

	"In-Country" (Southeast Asia)	"In-Service" (Elsewhere)
	%	%
Never married	5.6	6.9
Widowed	0.6	0.7
Married	83	84
Separated/Divorced	11.2	8.3
Missing info	1.0	1.5

Virtually all the married men report that they are currently living with wives. However, many of those currently married have been divorced previously as will be discussed below.

The Relationships Between Combat and Social Factors:

A major hypothesis of the Vietnam Veterans Study is that exposure to traumatic military experiences will have resulted in measurable increases in adverse mental, physical and social effects. We do not here consider the question of post-traumatic stress disorder (PTSD) itself but rather focus on income, divorce rate, educational attainment and report levels of general happiness and satisfaction. PTSD analysis is reserved for a later report.

Our analysis shows a clear and consistent adverse social effect of exposure to traumatic situations (combat) among members of the study population. Specifically, we find that as the mean level of traumatic combat experiences rises so does the divorce rate. Conversely, with increased levels of combat annual family incomes decline as do the reported levels of general happiness and satisfaction. Further, we find that educational attainment, a key indicator of socio-economic status and well-being, cannot account for this effect.

Educational Attainment and Combat Experience: We have examined the distribution of educational attainment levels of the population of men who served in Southeast Asia and of non-SEA veterans whose score on the combat scale was less than 10 (i.e. answered rarely or never to all the questions given above.) These data are given in Table 10.

TABLE 10
Educational Attainment By Combat Scale
percent distribution-educational attainment

combat level	1	2	3	4	5	6	N
non-SEA	>h.s.	h.s.	some college	voc/tech school	college	post-grad	
1 (1 to 10)*	5.2	41.8	21.6	15.0	12.2	4.2	3186
SEA service							
1 (1 to 10)*	5.3	39.7	21.6	16.5	12.5	4.4	473
2 (11 to 15)	5.6	41.8	18.9	15.8	12.8	5.1	514
3 (16 to 21)	5.3	36.0	24.4	14.1	16.0	4.1	581
4 (22 to 26)	5.7	37.2	25.8	15.6	10.7	5.0	403
5 (27 and up)	8.7	35.5	25.8	13.3	11.1	5.6	414

*Range of combat scale score

No significant trends or differences in the distribution of educational attainment were observed between men who did not serve in Southeast Asia and those who served in Southeast Asia at different levels of combat as reflected by the combat scale. This is in itself a very interesting finding, somewhat contradictory to the "common wisdom." (N.B. These data refer to educational attainment, not to education level upon entry into the service, where a difference may have been present. However, such disparate rates of post-service education needed to result in similar educational attainment by combat veterans is not likely to have occurred.)

Our second analysis is the distribution of annual family income levels by educational level. It is well known that income is closely related to educational attainment, with the more highly educated people earning in the higher income brackets. Table 11 gives the mean income level by each of the educational attainment strata for the study group.

TABLE 11
Mean Income Levels for Each Educational Attainment Stratum By Service in Southeast Asia

educational attainment level	"in-country" served in SEA	"in-service" served elsewhere
1	6.85	6.87
2	7.67	7.84
3	8.28	8.38
4	7.84	7.89
5	8.82	8.86
6	9.23	9.05

TABLE 11 (Continued)

income level ranges	1 < $6,000	6 = $14,000–15,999
	2 = $6,000–7,999	7 = $16,000–19,999
	3 = $8,000–9,999	8 = $20,000–24,999
	4 = $10,000–11,999	9 = $25,000–29,999
	5 = $12,000–13,999	10 = $30,000 or more

No statistically significant differences in the mean levels of income of men with equal levels of educational attainment were found between the entire group that served in Southeast Asia and the group that served elsewhere.

An analysis was also carried out of the mean levels of income as a function of year of birth, since it is also well known that income rises with years on the job until the age of retirement, when it falls again. This trend was observed among the Legionnaires in the sample, as shown in Table 12.

TABLE 12
Mean Income Levels for Different Birth Cohorts By Service in Southeast Asia

year of birth	"in-country" served in SEA	"in-service" served elsewhere
1 before 1930	8.40	8.47
2 1930–1939	8.36	8.25
3 1940–1943	8.22	8.36
4 1944–1945	8.23	8.25
5 1946–1947	8.11	8.34
6 1948–1949	7.68	7.81
7 1950–later	7.49	7.43

income level ranges	1 < $6,000	6 = $14,000–15,999
	2 = $6,000–7,999	7 = $16,000–19,999
	3 = $8,000–9,999	8 = $20,000–24,999
	4 = $10,000–11,999	9 = $25,000–29,999
	5 = $12,000–13,999	10 = $30,000 or more

Again no meaningful differences in mean family income range were observed between all men who served in Southeast Asia and all men who did not when compared by birth years.

Next, an analysis was carried out that calculated mean level of income by both year of birth and level of combat. Here we compare the men who served in Southeast Asia in each of the combat strata to each other and to the men in combat scale level 1 who did not serve in Southeast Asia. These data are shown in Table 13.

TABLE 13
Mean Income Levels for Different Birth Cohorts
By Service in Southeast Asia and by Combat Level

year of birth	"in-country" served in SEA		"in-service" served elsewhere	
	income level	N	income level	N
1 (before 1930)	8.39	83	8.46	141
combat 1	7.50		8.38	
combat 2	8.45		—	
combat 3	8.94		—	
combat 4	8.86		—	
combat 5	8.10		—	
2 1930–1939	8.36	223	8.26	396
combat 1	9.20		8.24	
combat 2	8.38		—	
combat 3	7.98		—	
combat 4	8.61		—	
combat 5	7.63		—	
3 1940–1943	8.23	277	8.37	885
combat 1	8.53		8.41	
combat 2	8.44		—	
combat 3	7.92		—	
comabt 4	8.03		—	
combat 5	7.91		—	
4 1944–1945	8.23	360	8.24	470
combat 1	8.34		8.23	
combat 2	8.42		—	
combat 3	8.36		—	
combat 4	8.42		—	
combat 5	7.51		—	
5 1946–1947	8.10	622	8.34	628
combat 1	8.19		8.41	
combat 2	8.45		—	
combat 3	8.36		—	
comabt 4	7.73		—	
combat 5	7.66		—	
6 1948–1949	7.67	564	7.80	482
combat 1	7.63		7.86	
combat 2	7.38		—	
combat 3	8.14		—	

TABLE 13 (Continued)
Mean Income Levels for Different Birth Cohorts
By Service in Southeast Asia and by Combat Level

year of birth	"in-country" served in SEA income level	N	"in-serve" served elsewhere income level
combat 4	7.59	—	
combat 5	7.44	—	
7	7.49	222	7.43	666
1950–later			
combat 1	8.30	7.55	
combat 2	7.54	—	
combat 3	7.16	—	
combat 4	7.38	—	
combat 5	6.53	—	

income level ranges	1 < $6,000	6 = $14,000–15,999
	2 = $6,000–7,999	7 = $16,000–19,999
	3 = $8,000–9,999	8 = $20,000–24,999
	4 = $10,000–11,999	9 = $25,000–29,999
	5 = $12,000–13,999	10 = $30,000 or more

Statistical analysis of these data show that there is a consistent and statistically different ($p < 0.001$) mean income level range between those men who served in Southeast Asia who reported combat experiences in the 4 and 5 range and all other men, both with and without service in Southeast Asia. In each case, combat 4 and combat 5 veterans earned less than their peers in the same age group. On the other hand, on an overall basis there was no statistically significant difference in income level range between all men who served in Southeast Asia and all men who served elsewhere in each age category.

This is an important finding in two major respects:

1. It demonstrates a major social impact of **significant income loss** on combat veterans who served in Southeast Asia.

2. It shows that it is necessary to differentiate **among** men who served in Southeast Asia on the basis of actual wartime experience in order to demonstrate some of the major effects of service.

Because the income levels on the questionnaire were obtained in terms of ranges rather than the actual figure, we cannot make an exact calculation of the differences in income between the groups. We can, however, place some boundaries on the ranges and make some estimates of the differences in annual family income between men with different service and combat experiences by interpolating the income value within the ranges. These calculations are as follows:

TABLE 14
Mean Income Ranges for Birth Cohorts
by Military Service Experience

year of birth	combat 5	combat 4-5	all SEA	all non-SEA
before 1930	$20,499	$22,049	$21,999	$22,999
1930–1939	$18,519	$20,749	$21,439	$21,039
1940–1943	$19,639	$19,839	$21,439	$21,099
1944–1945	$18,039	$19,799	$21,199	$21,149
1946–1947	$18,639	$18,759	$21,749	$20,549
1948–1949	$17,759	$18,039	$19,199	$18,679
1950 and up	$15,059	$16,399	$17,719	$17,959

These differences are large and are statistically significant ($p < 0.01$ for combat 5 compared to combat 1 inservice and $0.1 > p > 0.05$ for combat 4 and combat 5 compared to combat 1 inservice). For men who served during the height of the conflict, men born between 1944 and 1947, the average income difference is between $3,000-$4,000 annually. Although, as stated above, this is an approximation, the financial impact of service and heavy combat is apparent. These men appear to be literally paying a financial, as well as emotional, cost, as will be discussed below, for their combat experiences.

Because of the importance of these data and their implications for Vietnam veterans (and perhaps veterans of all heavy combat experiences — although we have not examined the question yet), we have refined our analyses and have also considered the question of whether combat and education exert independent effects on income and the relative magnitude of these effects using a multiple regression model. The model used was

$$\text{income} = \text{constant} + b_1 \times \text{education} + b_2 \times \text{combat} + b_3 \times \text{education} \times \text{combat}$$

where b_1, b_2, b_3 are coefficients to be estimated from the data. The results were:

$b_1 = 0.306 + 0.045$
$b_2 = -0.308 + 0.0071$
$b_3 = 0$ (no interaction)
constant = 7.298

where each coefficient is listed with its standard error. The values of beta (b/ standard error) were 0.163 for education and -0.104 for combat. These give an idea of the relative contributions of these two variables, with education being half again more "important" than combat in predicting incoming, but with combat exerting an important independent effect. The negative sign on b_2 means that high levels of combat lead to reduced income. Both variables were highly significant. There was no interaction term indicating that they exert independent effects on income.

This more sophisticated statistical analysis further confirms the conclusion stated above that the study has shown a strong and lasting independent effect of heavy combat situations on the family income of Vietnam Veterans.

Divorce Rates and Military Experiences: Another analysis of the social impact of military service that was examined was marital status. Little difference in **current**

marital status was observed among married members of the study population with and without service in Southeast Asia, as shown in Table 15.

TABLE 15-A
Current Marital Status by Service in Southeast Asia

	"in-country" Southeast Asia	"in-service" elsewhere
	percent distribution	
Never Married	6.9	5.6
Widowed	0.7	0.6
Married	84.2	82.5
Separated/Divorced	8.3	11.3

The differences arise in the analysis of divorce and experiences in combat situations. We restricted this analysis to men who were born between the years of 1944-1949, the peak birth cohort years for service during the Vietnam War and we also restricted the dates of all divorces to have occurred after entry into the service. When we analyze the distribution of never marrieds, marrieds/never divorced, and those who were divorced one, two or three times or more, as shown in Table 15, we observe a striking increase in divorce among those who served in the heaviest combat situations, with the percentages rising with combat level.

TABLE 15-B
Marital Status, Service Area and Combat Exposures

	COMBAT SCALE					
	not in Southeast Asia	served in Southeast Asia				
	1	1	2	3	4	5
Never Married	89	21	27	21	12	15
	6.4%	7.0%	7.9%	5.6%	3.9%	5.0%
Married/	1131	250	276	318	244	231
Never Divorced	81.8%	83.1%	80.7%	84.6%	79.7%	76.7%
Divorced Once	133	27	35	53	42	40
	9.6%	9.0%	10.2%	14.1%	13.7%	13.3%
Divorced Twice	27	1	4	12	8	13
	2.0%	0.3%	1.2%	3.2%	2.6%	4.3%
Divorced Three	2	2	0	2	0	2
or More Times	0.1%	0.6%	—	0.5%	—	0.7%
N	1382	301	342	406	306	301

The divorce rate for two or more divorces among men who reported the highest exposure to combat situations was more than twice that of all men who did not serve in Southeast Asia and who reported no combat like experiences. The divorce rate for one divorce is almost one and one-half times as great among men in combat scale level 5 compared to men in combat scale level 1, whether or not they served in Southeast Asia.

Other Measures of Happiness, Satisfaction and General Health: In this report we

consider two other broad measures of general well-being: the responses to two questions which together constitute a happiness-satisfaction scale (Cronbach alpha = 0.89):

a. Taking all things together how happy are you these days?

1. not at all happy	2. slightly happy	3. moderately happy	4. very happy

b. In general, how satisfying is your life?

1. not at all satisfying	2. slightly satisfying	3. moderately satisfying	4. very satisfying

and the responses to a report on general health:

c. In general, how would you describe your health now?

1. excellent	2. good	3. fair	4. poor

These general questions, of course, are not specific to particular illnesses, syndromes or other adverse effects. They are, however, in many studies (including this one) found to be highly correlated to such specific indicators.

In this population of Vietnam veterans we find that both happiness-satisfaction and general health are significantly negatively correlated with combat experiences, both when men who did not serve in Southeast Asia are compared to those who served in combat situations, and among men who served in Southeast Asia, but in areas with and without high levels of combat associated exposures. The strongest differences are observed among men who were born in the years 1944-1949. These data are shown in Tables 16 and 17.

TABLE 16
Happiness and Life Satisfaction by Year of Birth, Military Service and Combat

year of birth	"in-country" served in Southeast Asia		"in-service" served elsewhere	
Before 1930	**Mean**	**Standard Deviation**	**Mean**	**Standard Deviation**
combat 1	6.50	1.58	6.89	1.13
combat 2	6.58	1.26		
combat 3	6.33	1.59		
combat 4	6.07	1.49		
combat 5	6.60	1.23		
1930–1939				
combat 1	6.51	1.19	6.51	1.26
combat 2	6.57	1.30		
combat 3	6.14	1.31		
combat 4	6.03	1.73		
combat 5	5.77	1.74		
1940–1943				
combat 1	6.43	1.18	6.43	1.40
combat 2	5.96	1.53		
combat 3	6.02	1.33		
combat 4	5.71	1.35		
combat 5	5.35	1.63		

TABLE 16 (Continued)
Happiness and Life Satisfaction by Year of Birth, Military Service and Combat

year of birth	"in-country" served in Southeast Asia		"in-service" served elsewhere	
1944–1945	**Mean**	**Standard Deviation**	**Mean**	**Standard Deviation**
combat 1	6.61	1.37	6.63	1.33
combat 2	6.22	1.15		
combat 3	5.87	1.42		
combat 4	5.83	1.41		
combat 5	5.17	1.61		
1946–1947				
combat 1	6.45	1.15	6.42	1.36
combat 2	6.13	1.46		
combat 3	5.76	1.42		
combat 4	5.70	1.41		
combat 5	5.63	1.58		
1948–1949				
combat 1	6.21	1.30	6.33	1.33
combat 2	5.92	1.35		
combat 3	5.94	1.27		
combat 4	5.89	1.40		
combat 5	5.33	1.66		
1950–later				
combat 1	6.33	1.29	6.16	1.40
combat 2	6.36	1.15		
combat 3	5.65	1.53		
combat 4	5.97	1.30		
combat 5	6.00	1.47		

TABLE 17
Mean Levels of Reported Overall Health by Year of Birth and Combat

year of birth	"in-country" served in Southeast Asia		"in-service" served elsewhere	
Before 1930	**Mean**	**Standard Deviation**	**Mean**	**Standard Deviation**
combat 1	2.40	.81	2.25	.83
combat 2	2.60	.70		
combat 3	2.24	.89		
combat 4	2.29	.85		
combat 5	2.62	.81		

TABLE 17 (Continued)
Mean Levels of Reported Overall Health by Year of Birth and Combat

year of birth	"in-country" served in Southeast Asia		"in-service" served elsewhere	
1930-1939	**Mean**	**Standard Deviation**	**Mean**	**Standard Deviation**
combat 1	1.75	.71	1.92	.72
combat 2	1.90	.73		
combat 3	2:13	.71		
combat 4	2.34	.77		
combat 5	2.47	.76		
1940–1943				
combat 1	1.76	.59	1.79	.68
combat 2	1.79	.56		
combat 3	1.93	.70		
combat 4	1.94	.68		
combat 5	2.21	.91		
1944–1945				
combat 1	1.71	.60	1.75	.66
combat 2	1.90	.63		
combat 3	2.10	.74		
combat 4	2.14	.69		
combat 5	2.25	.76		
1946–1947				
combat 1	1.76	.59	1.72	.64
combat 2	1.83	.63		
combat 3	1.91	.59		
combat 4	1.96	.59		
combat 5	2.17	.77		
1948–1949				
combat 1	1.84	.51	1.71	.63
combat 2	1.95	.61		
combat 3	1.93	.56		
combat 4	1.97	.60		
combat 5	2.25	.76		
1950–later				
combat 1	1.82	.68	1.76	.63
combat 2	2.00	.65		
combat 3	1.96	.71		
combat 4	1.74	.62		
combat 5	1.76	.56		

The group means in each age stratum for men with Southeast Asia service were significantly different from the mean in each stratum of non-Southeast Asia servicemen in combat level 1. Among men who served in Southeast Asia, the means for combat level 5 were significantly different from combat level 1 for all but the youngest

and the oldest age strata, the same trend that was observed for comparison between SEA men in combat 5 and non-SEA in combat 1. These data are a confirmation both of the stressful effects of the combat experience and of the particular effect it had on the men who were born in the period of 1944–1949. These men clearly bore the brunt of the war and its aftermath.

ATTITUDES AND PERCEPTIONS OF THE VETERANS ADMINISTRATION

One of the aims of the study was to gain a better understanding of Vietnam Veterans' attitudes, perceptions and utilization experiences of the Veterans Administration and its facilities. This is particularly important since The American Legion and other veterans' groups are concerned both with improving the quality of the Veterans Administration and also ensuring that it receives adequate funding and support in order to fulfill its obligations to the nation's veterans. The adequacy of the Veterans Administration is particularly important to the group that is represented by the sample in the study population because a very large percentage is either uninsured or underinsured through private insurance, as shown in Table 18.

TABLE 18

Percentage of Respondents with Hospital and Major Medical Coverage

	"in-country" Southeast Asia	"in-service" elsewhere
"Do you have hospital health insurance?"		
Yes	87.4%	88.8%
No	12.6%	11.2%
Do you have additional major medical coverage?		
Yes	58.8	62.3
No	39.8	37.7

Clearly there are many men who depend on the Veterans Administration for health care. There also appears to be a difference in health insurance between those with and without service in Southeast Asia but the full ramifications of these figures will become more clear as occupation and unemployment status are coded.

We have examined the questions of Vietnam veterans attitudes and perceptions of the Veterans Administration with an extensive set of questions based on issues submitted to John Sommer by American Legion field representatives who monitor VA facilities, supplemented with additional questions we felt to be relevant to the study.

We divided the questions into several sections:

General feelings
Actual experiences at a VA facility
Agent Orange Examination
Experiences at VA for mental health assistance

Tables 19 and 20 give a breakdown of the percentage distributions of answers given by the first 5471 of the respondents whose questionnaires had been entered onto the computer. The data on experiences at the Veterans Administration are based on the responses of approximately 1150 people who have used the facilities.

TABLE 19
Percentage Distribution of Feelings and Attitudes About the Veterans Administration

	Not true	Slightly true	Moderately true	Very true
In an emergency situation I would prefer to go to a VA facility than to a community hospital	68	13	11	8
The VA system is a good, secure alternative for me for health care needs in the future	28	29	22	21
The lifetime health benefits of the VA were a strong incentive to me to join the service	81	9	5	5
The VA system provides security and peace of mind to most Vietnam vets	39	32	21	8
Most Vietnam veterans have very positive feelings about the VA	34	35	24	7
I have been fully informed about the availability of an Agent Orange Examination at the VA	66	11	8	15
I am fully aware of all the benefits available to me as a Vietnam vet	51	22	17	10
I am very knowledgeable about the procedures for applying for compensation and pension	68	18	9	8
I am aware of the workings of the Vietnam Veterans Outreach Program	67	20	8	5

TABLE 20
Percentage Distribution of Feelings and Attitudes About the Veterans Administration

	Not true	Slightly true	Moderately true	Very true
I was given an appointment with a reasonable time	10	22	31	47
The medical staff of the VA has a positive attitude toward Vietnam vets	17	25	33	25
Vietnam veterans are treated the same as veterans of other wars	19	17	30	35
The medical staff is competent	8	19	42	31

TABLE 20 (Continued)
Percentage Distribution of Feelings and Attitudes About the Veterans Administration

	Not true	Slightly true	Moderately true	Very true
The staff of the VA is well aware of the special Vietnam veteran needs like Agent Orange	22	29	31	18
I was asked about the possibility of exposure to Agent Orange	68	5	6	21
There is an adequate staff at the VA to meet patient needs	24	28	32	16
The VA service is well organized and smoothly running	26	30	32	12
There is a lot of paperwork and "red tape" involved in using the VA	13	19	27	41
The staff at the VA is courteous to patients	9	21	43	27
The staff at the VA was helpful to me in filling out the required paperwork	16	23	34	26
The facilities available for doing the paperwork were private	32	27	28	12
I have always been fully informed about the examinations and tests I have undergone at the VA	30	20	24	26
Taken all in all, the service at the VA is as good as most other health care facilities I have dealt with	25	20	29	26

There is a large difference in the percentage breakdowns of the attitudes and perceptions of all the respondents, those who used the facilities and those who didn't, versus the satisfaction of those who used the VA. The attitudes and perceptions of the whole group are much more negative than the actual satisfaction of the users.

The attitudes and perceptions of the group as a whole are very negative toward the Veterans' Administration. Virtually no one considered the benefits of the VA as an incentive for joining the service. Fewer than 15% of the group could endorse the ideas that they were knowledgeable about procedure for applying for compensation and pension or were even aware of the workings of the Vietnam Veterans Outreach Program (VET Centers). Only 19% of the group would prefer the VA to a community hospital in an emergency and 68% answered "not true" to this preference.

The responses to actual experiences at the VA are much more positive although a considerable proportion still expresses very negative attitudes toward service, competence and helpfulness of staff at VA facilities. On the other hand, a large percentage express a great deal of satisfaction toward their experiences. There is a 45%–55% split between negative and positive attitudes, respectively, on the questions

whether "Taken all in all, the service at the VA is as good as most other health care facilities I have dealt with." Forty-four percent endorsed and 56% rejected the statement that the VA is a well organized and smoothly running operation.

Respondents were much more positive about the staff than about the VA itself. For example, 70% found the staff to be courteous and 73% endorsed the medical "competence" of the staff. 58% felt that there was a positive attitude toward Vietnam veterans, but only 25% could answer slightly true and 17% rejected this statement. Most people, 78%, felt they were given an appointment within a reasonable time.

Agent Orange Examination Program: There was greater dissatisfaction among the approximately 235 responses, on the average, to questions about the Agent Orange Examination Program than to questions about the Veterans Administration and its health facilities in general. More than half of the respondents endorsed negative or only slight positive answers to questions of promptness and quality of service. Forty-four percent answered "not true" to being "very satisfied with the way they [the VA] handled the Agent Orange Examination Program, and 23%, 20% and 13% endorsed "slightly," "moderately," and "very" true, respectively.

It is important to note, however, that the responses to these questions of attitudes, perceptions and experiences are colored by the veterans' own personal combat experience. We can see this trend in an analysis of experiences at the VA and attitudes toward the VA among veterans who served in Southeast Asia (regardless of level of combat) compared to veterans who served elsewhere during the era. These trends and their meaning are explored more fully in the subsequent report on PTSD and other measures of emotional well-being.

In order to simplify the comparison we have tested and developed four reliable scales which measure attitudes and experiences. Scales are a combination of answers to questions that are found to be highly correlated to each other. The degree of reliability of a scale is represented by alpha. By scaling several responses together we are able to present a more coherent analysis of a complex situation. The four scales (and their reliability alphas) are as follows:

VASECURE:	the VA system is a good, secure alternative	
	the VA system provides security and peace of mind	
	most Vietnam veterans feel very positive	
alpha = .84		scale range = 3 to 12
VAINFORM:	I am fully aware of all benefits	
	I am very knowledgeable about procedures for compensation	
	I am aware of workings of Vietnam Outreach Program	
alpha = .81		scale range = 3 to 12
VAHELPFL:	The staff is courteous	
	The staff is helpful with paperwork	
	Private facilities for paperwork	
	Fully informed about exams and tests taken	
alpha = .78		scale range = 4 to 16
VASERVCE:	Medical staff has positive attitude toward Vietnam Vets	
	Medical staff is competent	
	Taken all in all service as good as most other facilities	
alpha = .83		scale range = 3 to 12

Table 21 below shows the distribution of responses to these scales separated into

two groups: "in-country" veterans who served in Southeast Asia and "in-service" veterans, who did not serve in Southeast Asia.

The distributions are different between the two groups. The "in-country" veterans feel more informed about the Veterans Administration but both on individual levels and in the group averages rate the VA lower than the in-service veterans. The next phase of the analysis will take combat level into consideration.

Analysis of the group means, for both the "in-service" and the "in-country" groups, show that there is about an even split in the group in the overall perception that the VA provides security to the veteran and that the service is good. Fewer than half, on the average, very positively endorsed the VA's information services but more than half the group endorsed the actual helpfulness of the staff at the facilities as reflected by the four questions which comprise the scale.

TABLE 21

Percentage Distributions of Responses To Veterans Administration Scales

SCALE	RANGES				AVERAGE
	3-5	6-9	10-12	13-16	
VASECURE					
SEA* service	45%	43%	13%		6.16
no-SEA service	35%	50%	14%		6.57
VAINFORM					
SEA service	60%	27%	7%		5.16
no-SEA service	72%	20%	5%		4.78
VASERVCE					
SEA service	23%	46%	30%		7.8
no-SEA service	12%	43%	44%		8.76
VAHELPFL					
SEA service	10%	34%	33%	23%	9.9
no-SEA service	5%	30%	35%	30%	10.7

*(SEA service = served in Southeast Asia)

Additional analysis of the Veterans Administration aspect of the study will be forthcoming and will include:

Mental Health services
Analysis by Department of The American Legion (regional differences)
Analysis by level of combat and by existing medical conditions