Fall 1986

Epidemiologic Studies on Exposure Patterns to Agent Orange in Vietnam Veterans and Vietnamese Migrants to the South Bay Region

David William Weller
San Jose State University

EPIDEMIOLOGIC STUDIES ON EXPOSURE PATTERNS TO AGENT ORANGE IN VIETNAM VETERANS AND VIETNAMESE MIGRANTS TO THE SOUTH BAY REGION

A Thesis

Presented to

The Office of Graduate Studies and Research

San Jose State University

In Partial Fulfillment

of the Requirements for the Degree

Master of Science

Special Major:

Environmental Biology

by

David William Weller

August, 1986

APPROVED FOR THE OFFICE OF GRADUATE STUDIES

Henry Robinson, PhD.

Richard L. Ingraham, PhD.

Frank R. Schiavo, M.A.

APPROVED FOR THE UNIVERSITY

ACKNOWLEDGMENTS

I would like to express my deep appreciation to the following people:

- to my mother and father, Mary and William Weller, for raising me to believe that people are important;

- to Rebeca Rangel, who patiently put up with my frustration while my first thesis topic was slipping from my grasp, and for encouragement;

- to other unnamed friends whose enthusiasm and interest in this topic fed me;

- to my good friend Duc, who helped in translating early-on and whose requested and unrequested help was an inspiration;

- to my other Vietnamese friends, Van-Phi and Khanh Nguyen, who were always willing to talk, Canh Le, for his cheerful help, and Tuyen Le, M.D., for her input;

- to Rose Sandecki at the Concord Vet Center, Ron Greenman (formerly at ITEC), and all the other vets I met;

- to Dr. Henry Robinson, my chairperson, who jumped in with both feet when I asked for his support and who kept me "on course" when I wanted to get too involved;

- to Dr. Richard Ingraham, who was always a pleasure to visit with and talk to;

- to Frank Schiavo, friend extraordinaire, who originally suggested I look into the Special Major Masters program at SJSU, and who provided information and support;

- to Dr. Jean Beard and Patricia Prather for assistance with the computer, and Kathy Duncan who did most of the computer work.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

Chapter 1

INTRODUCTION

Studies on the problems of Vietnam veterans, especially in relation to herbicide exposure, continue to pose complicated questions to the interested investigator. The same can be said about studies of Vietnamese who have come to live in the United States following the end of American involvement in 1975.

Diseases are one complication of the "cause and effect" relationship (1). Currently, veterans report the following as frequent medical complaints: dermatologic disorders, neurologic difficulties (numbness, tingling in extremities, headaches, fatigue, depression, and sexual dysfunction, among others), psychologic disorders, reproductive problems, cancer, gastrointestinal disorders, infections, hypertension, hepatic hematologic, genitourinary, respiratory, and cardiovascular problems.

The hundreds of thousands of refugees from Vietnam brought with them the potential for a number of latent and chronic infections; some unknown to U.S. medical personnel. These included many diseases which may, as with veterans, complicate the analysis of herbicidal effects. While the majority of refugees coming to the U.S. would be free of

major contagious disease (2), others entered with some highly infectious diseases. Tuberculosis was the most common infection of immigrating and immigrated Southeast Asians (3). As many as 40-50% tested positive with the tuberculin skin test (4). Melioidosis (a rare bacillary disease in the western hemisphere) is endemic in Southeast Asia, and, like tuberculosis, can have a long latency period. In one study from the University of Connecticut, 65% of examined Indochinese refugees were found via stool specimens to be infected with one or more parasites upon examination. Among the most prevalent helminths found were hookworm, Ascaris lumbricoides (giant intestinal nematode), Trichuris trichiura (whipworm), and Clonorchus sinensis (oriental liver fluke). Among pathogenic protozoans, Giardia lamblia (intestinal flagellate) occurred frequently. Endolimax nana and Entameba coli were common non-pathogenic amebae (5).

One of the most important aspects of a study of herbicidal effects would be documentation of degree of exposure. This will be one of the most difficult, if not impossible, parameters to assess. Despite the difficulties, Stevens (6) attempted the first quantification of TCDD (dioxin) exposure via Agent Orange for veterans. The three-pronged study of the Centers for Disease Control (CDC) currently uses what is considered the "best approach," although admittedly imperfect. It cites problems of flawed

military record-keeping during the war as a major predicament. CDC studies plan to document a "best approach" through the use of U.S. Army Company morning reports (showing daily presence or absence of an individual soldier) and Battalion journal files (identification of company in time and locale).

The issue of harm to human health by the use of herbicidal, or other, chemicals employed during the course of United States' involvement in Vietnam has the potential to be one of the longest and most bitter vestiges of America's longest war.

The Veterans Administration (VA) position is that the preponderance of evidence (or lack thereof) indicates long-term harm has yet to be proven (7), and accepts the need for further study. Many veterans, their attorneys, and other advocates point to the amount and degree of morbidity and mortality in the "Vietnam veteran" population to support their case. They maintain that chemicals were so widely used that chemical exposure must explain the problem since the wide range of veteran maladies differs so markedly from previous wars.

The present study was not an attempt to provide any final answers. The discussion will make clear the problems inherent in this study. It was an attempt to give direction and, perhaps, clarity to future efforts. Directly comparing the responses of two different, yet potentially exposed,

populations, Vietnam veterans (acute) and native Vietnamese (chronic), is a new and different approach to the herbicide question.

The three major objectives of this investigation were to:

1. develop a non-biased questionnaire for future use;
2. conduct a pilot study; and
3. analyze and modify the questionnaire used to remove bias.

Chapter 2

REVIEW OF LITERATURE

Historical Chronology

Dioxin or TCDD (2,3,7,8-tetrachloro-dibenzo-p-dioxin) often is described as the most toxic, synthetic chemical yet discovered. It is currently the focus of billions of dollars of litigation. This contaminant of Agent Orange, the major herbicide used during the Vietnam War, has made it the most closely studied chemical of recent years. The toxicity of 2,3,7,8-tetrachloro-dibenzo-p-dioxin (TCDD as it will be called in this paper) is well known (8-15). Most of the controversy over use of herbicides in Vietnam revolves around TCDD. The active ingredients of other herbicides, such as picloram (Agent White) and cacodylic acid (Agent Blue), also should be assessed (16).

In May, 1961, a request from the Office of the Secretary of Defense was received by the Crops Division at Fort Detrick, Maryland, to evaluate the effectiveness of jungle defoliation in Southeast Asia. After consideration of various factors, including effectiveness and availability of ingredients, two herbicidal mixtures were delivered to Ton Son Nhut Air Base in the Republic of Vietnam in January,

1962.

One was a mixture of the n-butyl esters of 2,4-dichlorophenoxyacetic acid (hereafter referred to as 2,4-D) and 2,4,5-trichlorophenoxyacetic acid (hereafter referred to as 2,4,5-T) and the iso-butyl ester of 2,4,5-T. This mixture was code-named Agent Purple, for the identifying purple band around the delivery drums. The second mixture, Agent Blue (blue drum banding) was formulated to contain both cacodylic acid and the sodium salt of cacodylic acid (the latter contained pentavalent organic arsenic).

The aerial spraying in South Vietnam, code-named Operation "Ranch Hand," initially utilized the previously described herbicides. According to Young (15), J.W. Brown of the U.S. Army Chemical Corps, reported that the first shipments of Agents Purple and Blue were received in the Republic of Vietnam on January 9, 1962.

Additional herbicides, Pink and Green, were added to the "Ranch Hand" armamentarium during the next two years. Herbicide Pink, also used in a defoliation test program in Thailand (17) during 1963 and 1964, was a mixture of the n-butyl and iso-butyl esters of 2,4,5-T. Herbicide Green, used in limited quantities from 1962 to 1964 over South Vietnam, consisted of the n-butyl ester of 2,4,5-T.

Two additional herbicides were brought into the spray program by January, 1965, following evaluation of their effectiveness. They were identified as Agents White and

Orange. Herbicide White (white color band) was a 1:4 mixture of the active ingredients, picloram (4-amino-3,5,6-trichloropicolinic acid) and 2,4-D. Both ingredients were formulated as triisopropanolamine salts. Herbicide Orange eventually replaced Agents Purple, Pink, and Green for the duration of the spray program during the Vietnam War and became the most widely used military herbicide. Agent Orange was composed of a 50:50 mixture of the n-butyl esters of 2,4-D and 2,4,5-T. Following the discovery that the 2,4,5-T component of Agent Orange was contaminated during manufacture with TCDD, most uses of Orange were terminated on April 15, 1970. An anonymous letter published in Citizen Soldier (18), the paper of a Vietnam veteran advocacy group, disputed that defoliation was halted in 1970. According to Buckingham (17), defoliation flights had ended in 1970, with only crop destruction missions still being flown. These continued until January, 1971, when only two C-123's (the fixed-wing planes of the "Ranch Hand" fleet) were maintained for further mosquito spraying.

Nevertheless, the official announcement of termination occurred concurrently with an announcement from three federal agencies ("Agriculture", "Health, Education and Welfare", and "Interior") that use of 2,4,5-T would be restricted greatly within the United States. For more than thirty years prior to that announcement both 2,4-D and 2,4,5-T had been widely used in agriculture in the United

States to control unwanted plants (19, 20). Finally, in March, 1979, the Environmental Protection Agency (EPA) enacted an "emergency suspension" to stop most uses of 2,4,5-T and Silvex (21, 22).

These herbicides were used for specific reasons. Primarily, they were used to deny the cover of the jungle to the guerrilla forces fighting in Vietnam, i.e., defoliation. Secondarily, they were used against crops to deny their use by the guerrillas (13, 23, 24). This would include defoliation along highways and roads to avoid ambush. In addition, small amounts of herbicides were used to clear base camp perimeters, waterways, and lines of communication.

During American involvement in Vietnam, use of herbicides appeared to have extended beyond the borders of South Vietnam. Westing (24) believed spraying was mostly restricted to South Vietnam, but maintained that eastern Kampuchea (Cambodia), Laos, and possibly North Vietnam were sprayed to some extent. Use of Agent Orange in Laos also was suggested in an anonymous article in Chemical and Engineering News in the February, 1982, issue. In early 1980, the Pentagon declassified reports stating that Agent Orange was sprayed between October, 1967, and July, 1969, on 23,607 acres of the southern demilitarized zone (DMZ) in Korea.

Documented evidence now supports the various sources of information that spraying of all herbicides in Vietnam

extended over the years 1962 to 1971. Appendix A lists the major herbicide mixtures used in Southeast Asia. The period of initial introduction of herbicides in 1962 was followed by a period of expanded use of herbicidal agents from 1965 through 1966. The peak use of these products occurred during the years 1967 to 1969. They were phased out during 1970 to 1971 with the discovery of the teratogen TCDD in 2,4,5-T (25). In the end, not only did the opposition of scientific and citizen's groups contribute to ending the use of herbicides in Vietnam, international considerations were also a significant factor. In 1969, the Geneva Protocol on chemical and biological weapons had been sent by President Richard Nixon to the U.S. Senate for ratification. The on-going use by the United States of herbicides and chemical riot control agents in Vietnam had become a major detraction of U.S. image abroad.

Despite evidence accumulating since the late 1940's (some not reported in the open literature) warnings of toxic problems related to polychlorinated phenols were largely ignored (26). Occupational exposures during the manufacture of trichlorophenol (substrate for production of 2,4,5-T), and other related compounds, hinted at problems to come. Dr. Samuel Epstein, in testimony before a subcommittee of the House Committee on Veterans' Affairs (26), pointed out that TCDD had been identified as the agent in trichlorophenol causing chloracne as early as 1957. It is

difficult, therefore, to understand how the National Academy of Sciences (13) stated:

> They (herbicides) are selected because they can be manufactured cheaply and in large quantities, but also for the physical, chemical, and biological characteristics that minimize undesired side effects. They have been used worldwide in large quantities, on the whole without causing serious hazards.

The above proves doubly confounding upon reading selective citations given by Westing (24) dated 1963, 1967, 1970, and 1971, to name but a few, dealing with reports purportedly related to problems of herbicide exposure among Vietnamese.

Doubts about the safety of herbicide usage in the Vietnam War (also commonly referred to as the Second Indochina War) resulted in a call by the American Association for the Advancement of Science (AAAS) in 1969 for a study of herbicidal effects. Concern about the impact of human activity on the environment, especially the increasing destructiveness of modern warfare, seemed to have been a driving force behind the move. In addition, members of the AAAS were concerned about breaching the constraints against chemical and biological warfare. The AAAS joined the Federation of American Scientists (FAS) who had, in 1964, expressed reservations about the use of chemical or biological weapons on foreign shores (23). According to Orians (27), at one point neither Vietnamese nor American officials were disclosing information about

chemicals used, areas sprayed, or the chemical action of the agents.

Due to the concern over the issue of exposure to herbicides in Vietnam, especially the TCDD contaminant of Agent Orange, numerous studies have been completed or are still in progress. Studies which have ended include: an Australian birth defects study of Australian veterans of service in Vietnam (28); a Vietnamese birth defects study (29); and a CDC birth defects study, to mention a few. One of the long-term investigations includes the "Ranch Hand Study," conducted by the U.S. Air Force, which is expected to report the results of examinations of Operation "Ranch Hand" personnel periodically.

The CDC has taken responsibility for another two-pronged study from the VA: one part to assess the health effects of Agent Orange on veterans; the other segment to assess the health effects of the "Vietnam experience." This is a very abbreviated listing of the numerous studies going on worldwide.

Some of the factors complicating the study of herbicide effects in veterans and Vietnamese were mentioned previously. A November 30, 1982, article, which appeared in the New York Times, and subsequently in a compilation of articles on the health of veterans prepared by the Congressional Research Service, reported that the Defense Department, "... estimates that most troops probably got

heavier exposures to insecticides, antimalarial drugs, fuel vapors, parasites, narcotics, alcohol and many other toxic substances than they did to Agent Orange."

Whether this statement ultimately proves to be correct remains to be seen. However, it does recall an earlier discussion of disease factors in the "Introduction." Before moving into a discussion of the literature on herbicides used in Southeast Asia, a few elaborative comments about disease in veterans and Vietnamese are appropriate.

Many diseases complicate the cause and effect relationship in regards to veterans (1). Malaria was the most significant health problem in terms of person-days lost; and with the appearance of chloroquine-resistant malaria, dapsone, a drug previously reported to cause agranulocytosis in susceptible individuals, came into use and was later withdrawn (30). Both infectious and serum hepatitis (HA and HB) were present. Serum hepatitis was related to blood transfusions and I.V. drug use. Infectious hepatitis posed a lesser problem than in previous wars. Fever of undetermined origin (FoUO) was widespread, proving to be second in prevalence only to venereal disease. Gonorrhea was the most common venereal disease, accounting for 90% of sex-related diseases. After 1968, neuropsychiatric diseases rose rapidly, and by 1970, became the second leading disease problem. Neel (31) noted that escalation of drug abuse followed the rise of

neuropsychiatric disorders. Skin diseases were found widely from 1965 to the end of U.S. involvement in Vietnam. Other, less common, diseases also were present. Increased incidence of certain diseases was often traced to variation in seasonal rainfall (31).

Among Vietnamese, a number of disease states (in addition to those previously mentioned) were documented. Chronic nutritional deficiencies were inferred to be part of the cause of stunted growth among children from Southeast Asia (4). Fourteen percent of refugees exhibited Hepatitis B surface antigen, while another 80-90% were detected to have HB serologic markers (4). Possible blood and tissue parasitic infections included filariasis, schistosomiasis, paragonimiasis, and malaria. Plasmodium vivax (in some cases chloroquine-resistant P. falciparum) was by far the most common species implicated in malaria (3).

Among mental health problems of recent immigrants, depression was often noted (4, 5). Relocation and resettlement temporarily alleviated such problems, but loneliness, anxiety, helplessness, and homesickness resulted in any number of psychosomatic symptoms (4).

An additional factor obscuring potential TCDD effects--the most suspect chemical--was the use of a number of other potent herbicides. The two of major concern were Agent White, with its picloram component, and Agent Blue, with

cacodylic acid.

Among the current studies to elucidate the problems of Vietnam veterans is a 3-pronged initiative by the Centers for Disease Control. It is hoped that these studies will clarify the issues and cover as many major concerns as possible.

One study, referred to as the "Vietnam Experience" Study, a retrospective cohort study, compared male veterans of the Army who served in Vietnam against those who served elsewhere. It was meant to assess possible health effects of the "general Vietnam service experience" (1).

A case-control study, termed the "Sarcoma/Lymphoma" Study, will examine the risk of Vietnam veterans contracting soft tissue sarcoma and lymphoma as a result of service-connected exposures.

The third retrospective study is being called the "Agent Orange" Study. This will examine the health effects of possible herbicide exposure, with special emphasis on Agent Orange (and its TCDD contaminant). This study also will examine three cohorts of Vietnam veterans, representing differing levels of exposure.

The latter study, describing the effects of exposure to Agent Orange in the veteran population, points in the direction that virtually all investigations have to date. Specifically, that Agent Orange, and its TCDD contaminant, is responsible for most, if not all, unusual physical

maladies experienced by veterans. Volumes have been written about Agent Orange (and TCDD) lately. This body of information represents all the available literature. More would be learned from expensive toxicological research, but the effort at hand involves no toxicological research.

The questionnaire distributed, which is the basis of this thesis, asked respondants to identify, if possible, the herbicide to which they believe they may have been exposed. The herbicides listed included: Agents Orange, Orange II, White, Blue, Purple, Pink, and Green. Probably the only people who would know with certainty would be handlers, loaders, and possibly aircraft (helicopter and C-123) crew members. In fact, Vietnamese from the local areas did most of the ground handling (13), which explains part of the interest of the author in studying immigrant Vietnamese.

Because of the previous nearly complete focus on Agent Orange (TCDD), the following literature review will necessarily reflect that trend. Noting the discussion of Agent Orange in the historical chronology (page 5), it will be recalled that Orange is a 50:50 mixture of the n-butyl esters of 2,4-D and 2,4,5-T.

During the manufacture of 2,4,5-trichlorophenol, a precursor in the production of the herbicide 2,4,5-T, a toxic contaminant, TCDD, is generated in trace amounts (32). It is a colorless and crystalline solid at room temperature,

first synthesized in 1957.

Tetrachlorodibenzo-p-dioxin is actually one of a group of seventy-five compounds called dioxins. The 2,3,7,8-TCDD congener is the most toxic of the series. The structure of dibenzo-p-dioxins, as a group, consists of two benzene rings attached by two oxygen atoms, as shown in Figure 1.

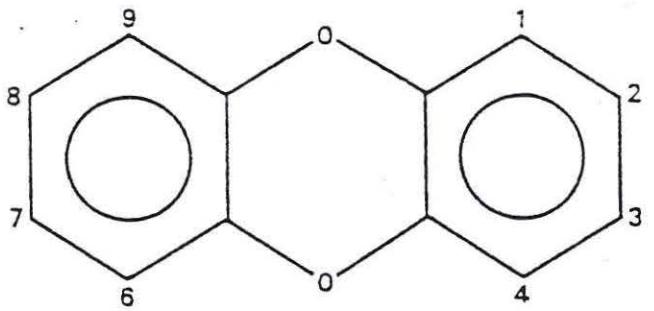


Figure 1

The structure of dibenzo-p-dioxins

The seventy-five variants possible involve hydrogen or halogen substitution. Of the seventy-five different chlorine-combined dioxins possible, only forty have been prepared and identified as of 1984. Five others have been identified but not separated. Twenty-two tetrachloro-isomers have been prepared by Dow Chemical Company (33).

The most widely studied isomer of chlorine-substituted dioxins is the 2,3,7,8-tetrachloro-dioxin; the structure is given in Figure 2 on the following page. It has been shown

to be the most toxic to laboratory animals and, therefore, possibly humans. There are other toxic dioxin formulations (13), generally relating to position and number of chlorines (9, 34).

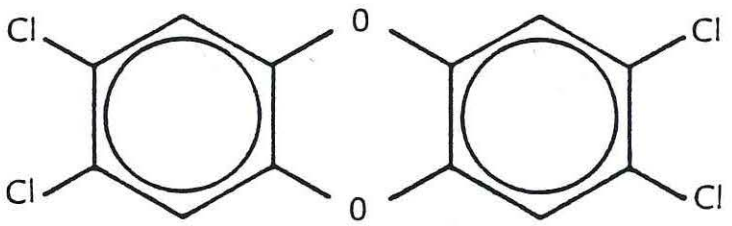


Figure 2

2,3,7,8-Tetrachlorodibenzo-p-dioxin

According to the Handbook of Toxic and Hazardous Chemicals (35), TCDD is described as a carcinogen (EPA-CAS) (A-40) and labelled a hazardous waste constituent and priority toxic pollutant by the EPA. The Chemical Abstract Service Registry Number (CAS) is 1746-01-6. The National Institute for Occupational Safety and Health (NIOSH) maintains a Registry of Toxic Effects of Chemical Substances Numbers (RTECS). The number assigned to TCDD is HP3500000. The number used by the United Nations to identify TCDD is A-40.

Upon formulation, TCDD is a white, crystalline solid which melts in the range of 302^{o} to 308^{o} C. Temperatures of 500^{o} begin decomposition with complete decomposition

following twenty-one minutes exposure at 800° C. Photodecomposition of the chemical, a much-discussed method of decontamination, will be discussed later. TCDD is chemically stable and extremely lipophilic.

Because of its effects, which will be discussed below, the suggested permissible exposure limits in air and permissible concentrations in water are given as zero. Due to insufficient data, the development of a criterion for protection of aquatic life is not presently possible (35).

In addition to its presence in herbicides utilized in Vietnam, dioxin-group contaminants (including TCDD) appear in chlorinated phenol wood preservatives and hexachlorophene, a bactericide. Due to the extraordinary toxicity of TCDD, even at extremely low concentrations, analytical work, even up to 1973, had been difficult. Prior to this time the limit of detection had been measured in parts-per-million (ppm). The work of Meselson and Baughman (36) pushed the limits of detection down to the level of parts-per-trillion (ppt). This was acknowledged as a great step forward in the critical work of measuring TCDD at the levels at which it exerts its biological effects (13).

Chloracne is a clinically acceptable symptom of exposure to certain chlorinated hydrocarbons, especially TCDD (37, 38). According to Crow (34), mild exposure to chloracnegens may closely resemble adolescent acne. The position of

position of occurrence may be used to differentiate between chloracne and acne vulgaris. Chloracne is more likely to be found outside and under the eyes (malar crescent) and behind the ears. Involvement of the rest of the face, neck, shoulder, genitalia, chest, and lower trunk may arise (in that order) with heavier exposure, while the limbs are generally untouched, except for the heaviest exposures (11). Other skin lesions are common, including: inflammatory nodules, infected cysts, cellulitis and carbuncles (37). TCDD may enter the body through the skin, or by absorption in the respiratory or gastrointestinal tract.

Chloracne has been observed in the occupational setting for years. One of the earliest accidents occurred in 1949 and involved a plant manufacturing trichlorophenol, a 2,4,5-T precursor. The Nitro, West Virginia plant breached its reactor vessel exposing many workers. Several wives of plant workers, as well as the workers, experienced chloracne, as well as other symptoms. Accidents at Ludwigshafen, Federal Republic of Germany, in 1953, in the Netherlands, in 1963, in Czechoslavakia, during the mid-1960's, and the Seveso incident in 1976, to name but a few, show chloracne is a widespread result of TCDD exposure (39).

Young (15) cited chloracne as a consistently observed clinical feature, which in the worst cases of exposure involved the chest and inguinal area with scarring generally

increased.

Kociba (8) and others have postulated the areas effected by TCDD lack major hair growth. These areas, lacking long hair shafts to act as "wicks" for accumulated debris, become congested. Moses, et al (40), upon examining the Nitro plant workers who had chloracne, found no relation between chloracne and other skin diseases.

Skin lesions seen commonly with TCDD exposure are those associated with disordered porphyrin (a heme pigment) metabolism, which include: hyperpigmentation (also separately recognized in TCDD exposure), hypertrichosis (often manifested as unusual facial hair growth), crusted ulcerations and erosions, and scars (37). Photosensitivity of the skin also may be found (15).

In some people exposed to sufficient TCDD, urine appears dark, due to the presence of increased urinary uroporphyrins. Brodkin (37) described it as looking like strongly brewed tea. The list of human illness related to occupational exposure to chlorinated phenols (trichlorophenol, the 2,4,5-T precursor) given in Moses, et al (40), found acquired "porphyria cutanea tarda" a commonly occurring phenomenon. The International Agency for Research on Cancer (IARC) also noted "porphyria cutanea tarda" as a toxic effect of TCDD in humans.

Acquired "porphyria cutanea tarda" is not the lone effect of TCDD on the liver. Structural alterations,

changes in serum enzyme levels, and changes in the biliary system have been noted in animal species. Human exposure also has resulted in observed liver damage, possibly including liver cancer. Enlargement of the liver has been found in numerous cases of human exposure (1, 41).

Changes in enzyme levels also have been reported. TCDD and other polychlorinated dibenzodioxins are found to very strongly induce microsomal monooxygenase activity. This system of enzymes serves to metabolize foreign lipophilic chemicals to more polar, therefore more readily excretable, products (32). It is found embedded in the endoplasmic reticulum of the cell. Children living in Seveso showed increased urinary output of d-glucaric acid, an indirect measure of hepatic microsomal enzyme activity. TCDD is an extraordinary inducer of such enzymes; estimated to be 30,000 times more powerful at induction than 3-methylcholanthrene, a prototypical enzyme inducer. In several other instances elevated levels of liver enzymes have been discovered (1).

Neuropsychological effects following exposure to TCDD are well recognized. Victims of industrial accidents have reported fatigue, headaches, weakness, and pain (especially in the extremities), sexual dysfunction, loss of appetite, and irritability. Diminished sensory complaints, including taste, auditory acuity, as well as a decreased sense of proprioception, have been noted by researchers (1).

Following the Seveso accident, neurological studies were conducted. Some people located in the area of highest TCDD contamination were found to have neuronal damage. This took the form of reduced nerve conduction velocity. Significantly, those with chloracne or increased serum hepatic enzymes also exhibited a higher prevalence of altered nerve conduction velocity (1). Reggiani (11) did not find this to be the case. When inhabitants of Seveso were compared with a nearby, nonexposed population, the same range of motor conduction velocities were shown to exist in both groups. In another accident, however, abnormal sensory and motor conduction velocities were found in 22% of cases.

Among all animal species studied, TCDD has produced a loss of lymphoid tissue, especially in the thymus (32), the so-called "master gland of the immune system." This occurs in acute and subacute doses. Thymus weight appears to be a very sensitive indicator of TCDD exposure. Doses which had no effect on the weight of rats, mice, and guinea pigs decreased thymic weight. Horses exposed to TCDD-contaminated oil at a Times Beach, Missouri, ranch were found to have spleens only one-third normal size, as well as small and inactive lymph nodes (1). The developing immune system (pre- and post-natal) is more severely effected than the mature immune system.

Immunologic effects in humans following TCDD exposure have been rare. Among workers at the Ludwigshafen plant,

increased susceptibility to infection was noted. This was not the case at Seveso. Observance of children did not appear to yield more sickness, or severity of sickness, than normal. Immunological tests proved normal. It will be recalled that Vietnam veterans complained of increased "infections" (1).

A wasting syndrome effects all species of animals, following an acute lethal dose (32). While wasting is not a lethal problem (death is not caused by weight loss), weight loss of up to 50% has been reported. As of 1984, the mechanism of toxic action of TCDD was still unknown (33).

The National Institute for Occupational Safety and Health (NIOSH) recommends that TCDD be treated as a potential occupational carcinogen. This decision is based on "reliable studies demonstrating TCDD carcinogenicity in rats and mice" (42). The agency cites several long-term, low-dose (μg level) studies of rats and mice which produced a wide variety of tumors; many of which were liver cancers (8).

In the case of the 1976 accident at Seveso, when a trichlorophenol (TCP) plant exploded, a notable increase in mortality from liver cirrhosis and leukemia occurred (10). In another study, ten years following an accident at a British TCP plant, seventy-nine workers who had developed chloracne were surveyed. No deaths from cancer had occurred in the ensuing ten years (38).

Reggiani (11) reported an increased prevalence of soft tissue sarcomas and lymphomas. This was related to increased occupational exposure to phenoxy acids, and thus, the TCDD contaminant. A Finnish study of forestry and railroad workers, who had used the same herbicides, found neither sarcomas nor lymphomas increased. The level of TCDD contamination to the Finnish workers was low, approximately 0.1-0.95 ppm. Working with dermal exposure figures from studies conducted in the United States and Sweden, Reggiani calculated the Finnish workers would have absorbed 0.000008 μg/kg/day. This represents a safety level of 500, if the oncogenic no-effect-level (NOEL) of 0.001 μg/kg/day of TCDD is accepted. The EPA has established the threshold limit value (TLV) in the manufacture of 2,4,5-T as 7 mg/kg, meaning a potential exposure of 0.0007 μg/kg of TCDD. This is figured using a 7-8 hour day, forty hours per week cumulative oral, dermal, and inhalation exposure. Young (15) described four cases of cancer among Finnish workers who sprayed 2,4-D and 2,4,5-T, when only two were expected in the age cohort exposed.

The question arises whether the increased lymphomas found in the Swedish workers may have resulted from immunosuppression. Previous reference was made to the effects of TCDD in animal experiments. This included a general loss of lymphoid tissue. Compromised immunity is the strongest risk factor for development of lymphomas (1).

Working with TCDD, the National Toxicology Program found mice had hepatocellular tumors, thyroid tumors, and fibrosarcomas of the integument. TCDD is thought to be a potent promoter of liver cancer (1). Van (43) implicated the TCDD contaminant of Agent Orange as the presumptive cause of liver cancer in an admittedly small population of Vietnamese he studied.

Dwyer and Epstein (44) gently criticized Van for small sample size, possible sampling bias, and lack of clear discrimination between exposure to phenoxy herbicides and other possible confounding variables, e.g., hepatitis B virus, aflatoxin, and certain parasites. They strongly suggest that further international attention is warranted. Suskind and Hertzberg (41), in a 1979 follow-up on the 1949 Nitro, West Virginia, 2,4,5-T accident, found no liver cancer.

The International Agency for Research on Cancer (45), covering chlorinated dibenzodioxins, reported on the work of Jirasek following a factory accident in Czechoslavakia. The plant produced 2,4,5-T and pentachlorophenol. Workers were exposed to an unknown amount of TCDD. Jirasek reported four deaths in the 5-6 years of the study. Two deaths were due to bronchogenic carcinoma. The IARC was careful not to draw any conclusions, but cited World Health Organization (WHO) figures which would anticipate fewer lung cancer deaths in five years in Czechoslavakia. No smoking histories were

available.

Weisburger and Williams (46) described TCDD as a powerful carcinogen. Kociba's work with rats fed 0.1 μg/kg/day was described as inducing squamous cancer in the respiratory tract and the oral cavity, and liver cancer in female rats.

The IARC wrote in its 1977 Monograph, "No evaluation of the carcinogenicity of chlorinated dibenzodioxins can be made on the basis of the available data." By 1982, the IARC, following a review of all carcinogenicity studies involving rats and mice, declared TCDD a carcinogen (33, 47).

Teratogenic effects of TCDD are well accepted in animal models (48). Harbison not only described TCDD as a teratogen and carcinogen, but also a potent mutagen. Whether teratogenic effects operate through the male, as many veterans claim, is still an open question. Can, et al (29), reporting for a reproductive epidemiology working group at an international symposium on the effects of herbicide use in Vietnam, stated:

> The Working Group accepts without dissent the animal evidence proving the teratogenicity (causing birth defects) of dioxin when administered to females, but remains unaware of any acceptable evidence of the transmission of this toxicity through the male.

While acknowledging weaknesses in studies reported to the reproductive working group at the symposium, mention was made of one Vietnamese study. Two cohorts of Vietnamese

women were examined for the outcome of their pregnancy. The study compared the pregnancy outcome of North Vietnamese women whose husbands had not fought in the south during the Vietnam War (who were therefore unexposed to herbicides), with women whose husbands had been south during the war (potential exposure). Results indicate that the wives of men who had served in the south were slightly more likely to experience a spontaneous abortion than the northern cohort. Full-term pregnancies showed a somewhat greater likelihood of resulting in congenital malformations among the south-north couples than among the north-north couples. Cleft palate was a prevalent malformation.

Toxic effects upon women leading to potential reproductive consequences are accepted as much more likely than male reproductive effects. Women are born with all of the ova they will ever produce, thus there is the possibility of toxic action on those germ cells (24).

Molar pregnancies, where a hydatidiform mole develops in lieu of a fetus, have been investigated by several Vietnamese researchers. While the evidence of an association with female exposure is suggestive (24), more rigorous work on any connection between the two is needed.

A case-control study of Vietnam veterans' risks of fathering a baby with birth defects was carried out by the Chronic Diseases Division of the CDC. In general, they found no difference between veterans and others studied.

Exceptions included: spina bifida, cleft lip, and "other neoplasms" (such as, neuroblastomas, lipomas, central nervous system tumors, Wilms tumor, and other benign tumors). Veterans who had children effected by the above defects had higher "exposure opportunity index (EOI)" ratings (33, 49).

In the occupational setting, following the Czechoslavakian plant accident, the wives of workers were queried. The rate of spontaneous abortion appeared normal. At Seveso, no increases in congenital malformations or developmental abnormalities were noted. Unfortunately, no baseline data on miscarriages were available. In addition, abortions were offered to women who elected to end their pregnancy. The wives of Dow Chemical employees, exposed to dioxins (including TCDD) at work, showed no statistically significant untoward pregnancy outcomes (1). In a case-control format, Donovan, et al (28), studying Vietnam veterans from Australia, found no connection between Vietnam service and congenital anomalies. Pearn (50) reviewed the literature with regard to teratogenesis via toxic insult on the male. Several substances are recognized as capable of causing male-mediated fetal effects. Several citations in the Pearn article related to TCDD. No malformations were reported, although reduced birth weight and litter size were recorded in one study. Long-term dietary treatment of rhesus monkeys

resulted in reduced spermatogenesis and histological change in testicular tissue.

Epstein (7), while reinforcing the difficulty of identifying teratogenic agents from other human exposures, described the 2,4,5-T/TCDD exposure of New Zealand sprayers as having a statistically significant association with the incidence of club foot.

In a re-examination program of the Nitro, West Virginia, workers exposed to TCDD following an accident at a 2,4,5-T plant, Suskind (41) found no difference between exposed and not exposed cohorts in regards to birth defects. Study participants were asked to report about birth defects to the staff of the study.

The mutagenicity of TCDD is still under close scrutiny. TCDD has been shown to be mutagenic (15) in several strains of Salmonella (TA 1532). In another strain, TA 1537, it was not. Some evidence of chromosomal aberrations has been found in rat bone marrow (42) at the microgram level and below.

Teresa Jean Fry, a graduate student at San Jose State University in the mid-1970's, studied the mutagenic potential of 2,4,5-T in Drosophila (51). The presence of TCDD was not confirmed. She concluded that a high concentration of 2,4,5-T, when fed to Canton S Drosophila melanogaster males, could produce recessive, lethal mutations on chromosome two. If present, TCDD would not

have been in excess of 0.002 ppm.

In several mammalian cell tests TCDD was found to be mutagenic. In others it was found not to be a mutagen. Following a single administration of TCDD to laboratory rats no chromosomal aberrations were recorded. However, with chronic doses chromosomal changes were shown to occur.

Trung and Dieu (52) studied peripheral white blood cells of inhabitants in two areas of southern Vietnam. They were separated into two groups, depending upon exposure to herbicides. Those who were free of disease and not using drugs capable of possibly causing chromosomal aberrations were chosen to participate. Results showed increased numbers of numerical and structural aberrations of chromosomes among more of the exposed than unexposed population.

There is a wide range of toxicity levels to TCDD necessary to cause death in laboratory animals (33, 42), which has not been satisfactorily explained. Depending on the animal, single or multiple doses (μg level) can lead to increased liver weight and fat accumulation, atrophy of the thymus, and tissue changes in the liver and thymus. The guinea pig is possibly the most sensitive animal to TCDD. The LD_{50}, via a single, oral dose, is in the range of 0.6 μg/kg. In rabbits the LD_{50} is 115 μg/kg.

Minute doses (in parts per trillion), when fed to monkeys over a period of time, produce reproductive problems

and death (7). In nearly similar doses over time, rats fed TCDD suffer cardiovascular changes.

Two other chemical mixtures used in Vietnam deserve mention, if for no other reason than they are generally ignored in favor of TCDD. These two chemicals were named Agent White and Agent Blue.

Agent White, used almost exclusively as a defoliant, utilized picloram as its active ingredient. White was the second most widely used herbicide in Vietnam. The National Academy of Sciences (13) reported that the acute oral toxicity for mammals was low. Studies of chronic toxicity showed the difficulty of producing pathological tissue change, according to the NAS. Young (15) cited his previous work to classify the "relative toxicity" of picloram as very low. Combining picloram with 2,4-D (as in Agent White) or 2,4,5-T boosts toxicity somewhat (13). According to Epstein (26), more recent re-evaluation by Reuber of histological material from an earlier study, indicates that picloram is "highly carcinogenic" in mice and rats. Testicular atrophy in rats and mice was noted, as well. The NAS reported no toxicity studies in humans.

Agent Blue proved useful in crop destruction due to the desiccation action of its principal ingredient. Blue was a mixture of sodium cacodylate and cacodylic acid (both arsenical compounds), in addition to a surfactant, salt, water, and an antifoam agent. Its toxicity is described as

moderate (13, 26). According to Epstein, cacodylic acid is not known to be carcinogenic, mutagenic, or teratogenic. Evans (53), however, raises the specter of cancer due to the known carcinogenic properties of arsenical compounds, in addition to possibilities of chromosomal damage. Evans further points to difficulties of water solubility leading to formation of breakdown products such as arsenates and arsine gas; thus leading to toxic problems.

Chapter 3

MATERIALS AND METHODS

An information questionnaire was obtained and modified from the law offices of Phillip Brown in San Francisco, a firm involved in Agent Orange litigation. Revisions for the current study included, for example, information about tour(s) of duty, branch of service, diagnosis and treatment for selected tropical diseases, choices of current work (agricultural or forestry work), physical/mental health of children (pre- and post-Vietnam), adult acne and occurrence (before, during, and after service in Vietnam), place of occurrence of acne on the body, knowledge of specific herbicide to which respondents may have been exposed, to name a few. Revisions included an easier-to-answer format which permitted computer compilation of data, as well as faster completion capability by the respondents.

Initially, 125 English versions (Appendix B) were printed. It became clear that more would be needed. After the initial run additional copies were printed as required. These were provided to several "Vietnam Veterans Outreach Centers." It was felt that the outreach centers might attract a cross section of veterans despite the fact that these centers are financed by the Veterans Administration

(VA), and many Vietnam veterans are angered by the VA's response to their needs. The outreach centers are funded specifically with the needs of the Vietnam veteran in mind. Their purpose is outreach to this population of veterans, in addition to counseling related to problems of re-adjustment.

When it became clear that questionnaires were not being returned in a timely manner, two actions were taken. First, a $5.00 inducement was offered, upon receipt of a completed questionnaire. Second, acquaintances of the author were contacted to extend questionnaire dissemination to Vietnam and Vietnam-era veterans. Since the purpose of this study was to produce a viable questionnaire for future use, the biases of money inducement and use of acquaintances of friends of the author were not felt to be overly biasing to the whole sample. The percentage of these questionnaires was small compared to overall response.

All questionnaires were self-administered. Two veterans centers (one in San Jose, the other in Concord, California) agreed to distribute the questionnaire to their regular clients and drop-ins. A poster was prepared for each center explaining the investigation.

The Concord Veterans Outreach Center received approximately forty questionnaires in early August, 1985. In late August, 1985, the San Jose Veterans Center received approximately sixty questionnaires because of the larger size of the potential population served and its proximity.

The cooperation of the veterans center at DeAnza College in Cupertino, California, also was enlisted. A poster was prepared and eight questionnaires were left for distribution to interested veterans.

Two other advocacy groups serving Vietnam and Vietnam-era veterans were contacted. One was the Veterans Assistance Center, with offices in Hayward and Berkeley, California. The second was the Vietnam Combat Veterans, Ltd., of San Jose. Questionnaires were supplied to both groups. Approximately ten were distributed to veterans at a Vietnam Combat Veterans, Ltd., meeting.

During the design phase of the study, the author spoke with veterans and noted in the literature that a high percentage of Vietnam veterans were imprisoned. Yager, et al (54), found veterans with more combat exposure were arrested, and convicted, in greater numbers than veterans who saw less combat. Investigating the possibility of having incarcerated veterans take the questionnaire resulted from the frequent mention of neuropathies following exposure to TCDD in the literature (11, 26, 38, 40, 53, 55). A question arose about exposure to Agent Orange (or other herbicides) and later imprisonment: could "anti-social behavior" and imprisonment be related to possible neurological damage, possibly the result of individual difference in ability to metabolize and excrete TCDD?

After speaking with officials at the Correctional

Training Facility at Soledad, during June, 1985, the author was told to write to Mr. Robert Dickover at the Department of Corrections in Sacramento. Mr. Dickover is a research program specialist and a graduate of San Jose State University. Following several months of exchanging letters and phone calls, the author met with Mr. Dickover in early November, 1985. He had said previously that the questionnaire was satisfactory to his office. A consent form (Appendix C) which had been prepared with his name and office telephone number met state research requirements. A question arose about approval of the proposed prison project through the Committee for the Protection of Human Subjects in the Office of Sponsored Programs at San Jose State University.

Ms. Natalie Harding, a proposal processor in the Office of Sponsored Programs, was approached about procedures required for approval from the committee. A letter of explanation (Appendix D) was appended to a questionnaire and consent form, and left for "human subjects research processing." Two of three committee members signed off "approved with risk." The third member indicated "approved with minimal risk."

Approval of the Committee for the Protection of Human Subjects was received. Mr. Dave Selvy, an assistant classification and parole representative, was contacted at the Correctional Training Facility. Mr. Selvy and Mr. Don

Chesterman, who also works at Soledad, arranged to place "information spots" on the cable television system at Soledad. The spots solicited the participation of Vietnam veterans at the Correctional Training Facility at Soledad. Eleven inmates eventually agreed to talk with the author and to take the questionnaire. The questionnaire was administered to ten inmates in March, 1986. The appointment with the eleventh inmate had to be cancelled due to time constraints. Security considerations at the facility were tightly controlled; it took all afternoon and part of an evening to meet ten of the eleven who agreed to participate.

The $5.00 inducement was offered to all Vietnam and Vietnam-era veterans following receipt of a completed questionnaire. A small number of veterans refused to accept the inducement. Veterans at Soledad were not allowed to be paid, despite the efforts of the author to see that some compensation was made.

Minor changes in questions and choices were made where necessary for Vietnamese respondents. Questions were changed only to fit the context of a person of Vietnamese origin. A Vietnamese translation (Appendix E) was prepared from a final English version. English versions of the final Vietnamese translation were made available for Vietnamese wishing to double check the intent of questions. To allow for direct comparison of responses in the computer, questions asked of Vietnamese were identical in order and

subject as those asked of veterans. The questionnaire was administered to Vietnamese living in Vietnam during the period when the herbicide spray program was carried out by American forces (1965 to 1971). Sixty thousand Vietnamese have settled in the southern San Francisco Bay Area since the end of American involvement in 1975. They had been residents in many parts of Vietnam. Many from the north of Vietnam also have come on the Orderly Departure Program (ODP).

The cooperation of the Indochinese Training and Employment Center (ITEC) was gained. ITEC operates an English-as-a-Second-Language (ESL) school (not just for Indochinese) near the San Jose State University campus. Dr. James Freeman, a professor of Anthropology at San Jose State, suggested that the author make contact with Dr. Nguyen Van Canh. Initial contact was made with Dr. Canh, ITEC's director, during the early summer of 1985. Eventually, after leaving several messages, an interview was arranged in July. Dr. Canh was enthused about having his students participate as an exercise. It was made clear, however, how extraordinarily political the use of herbicides had become to some members of the local Vietnamese community.

Dr. Canh suggested contact be made with Mr. Ron Greenman, the ESL school director. Mr. Greenman was a Vietnam veteran and was interested in the study. Upon

completion and printing of the Vietnamese questionnaire, a date of February 18, 1986, was set as the day the questionnaire would be administered. Prior to distribution, the Vietnamese questionnaire was checked against the English version with changes made only to insure clarity and control of bias in the evaluation procedures. Additionally, it was felt that Vietnamese taking the questionnaire in their native language would reduce bias in answering. Mistakes of dialect and accent markings were corrected by Vietnamese friends of the author.

Since classes occurred throughout the day, the author was required to spend the whole day at the school. Some of the accessed Vietnamese population were closely age-matched to the veteran population, according to demographic information supplied by ITEC before February 18. It was assumed that those who had lived in large cities in South Vietnam would have a history of non-exposure to herbicides, and therefore could serve as a control population to those who had lived in the countryside.

Six different classes throughout the day were administered the questionnaire. Age differences in classes varied greatly. Many of the younger students were perhaps too young to remember much about the war. Many had just recently immigrated.

A reasonable feeling of trust was established through the use of a cover letter (Appendix F) signed by a number

of respected Vietnamese. In addition to the cover letter, an introduction was added to the consent form of the Vietnamese version.

Numerous contacts were generated within the Vietnamese community. By contact over the telephone and in person, considerable time was spent in gaining the trust and confidence of members of this group. Eventually, some who were best known were asked to vouch for the good will of the author. Gaining the confidence and trust of this community were important to the author, and, they worked well in the collection phase of data for this study.

The "Statistical Package for the Social Sciences (SPSS90)" was used for data analysis. Four separate data files were established using Xedit, a line editor within the CYBER system at San Jose State University.

Chapter 4

RESULTS

A summary of questionnaire results appears in Appendices B and E. Questions which were essentially similar for American and Vietnamese respondents are located on the questionnaire found in Appendix B. Questions which bear more directly on Vietnamese respondents will be found in Appendix E.

Questionnaires were given to four distinct cohorts in this pilot study. Eighty-eight questionnaires were returned. They were: Vietnam veterans (n=35), Vietnamese (n=33), control veterans (n=11), and Vietnam veterans at the Correctional Training Facility at Soledad (n=9).

Nine completed questionnaires were returned from the San Jose Veterans Outreach Center. The Concord Center returned seventeen completed questionnaires. Ultimately, only two completed questionnaires were returned from the DeAnza College Veterans Center. No questionnaires were returned from the Vietnam Combat Veterans, Ltd., of San Jose. The Veterans Assistance Center returned approximately twenty of twenty-five questionnaires.

Analysis of demographic data for the cohorts showed

that the age breakdown was as follows: six were 25-29 years old, nineteen were 30-34 years old, thirty-seven were 35-39 years old, eight were 40-44 years old, and seven were forty-five years or older. Eleven did not report their age.

Breakdown as to sex was as follows: seventy-four were males and eleven were females. Three respondents did not report their sex.

Due to time, computer, and variable constraints, the author decided to see if the data gathered could be used to confirm the most well-accepted symptoms related to TCDD exposure, such as, chloracne, neuropsychological effects (depression, personality change, for example), change in sexual drive, hirsutism, and others.

Chloracne, described in the questionnaire as an acne-like skin outbreak, is the most consistent clinical marker of exposure to TCDD. All cohorts combined broke down into the following chloracne groups: thirty-one reported they had chloracne at one or more of seven positions on their body, forty-six reported they had no chloracne anywhere, one reported chloracne before service in Vietnam, and ten gave inconsistent responses or did not answer.

Seven of seventy-seven responses reported chloracne under their eyes. Ten gave responses which were inconsistent or did not answer. The most common position at which chloracne is found is under the eyes (malar crescent).

Eight of seventy-eight responses reported they had at some point had chloracne behind their ears. Ten gave inconsistent answers or did not respond. Thirteen responded that during or after their presence in Vietnam, they developed chloracne on the neck. Lack of neck involvement was reported by sixty-five, with ten giving an inconsistent or no answer. Twenty-one reported chloracne on their trunk, fifty-seven responded negatively, and ten were inconsistent or did not answer. Ten reported chloracne on their arms, thirteen stated their legs had been effected, while only three claimed to have had chloracne on their feet. Sixty-eight claimed they had not had chloracne on their arms, sixty-five said their legs had not been effected, and seventy-five responded that their feet had never developed signs of chloracne. Ten respondents gave inconsistent or no answers to questions of chloracne on their feet and legs, while only nine were inconsistent/no answer when asked about chloracne on their arms. Table 1 on the following page represents a breakdown of position of chloracne by cohort.

Skin color change is not recognized as a clinical marker as is chloracne. It was thought that a listing of the frequency of skin color might prove helpful. The results were as follows: eighteen described a nondescript

Table 1

Occurrence of Chloracne by Position on the Body

Occurrence	*	eyes	ears	neck	trunk	arms	legs	feet	TOTALS
Soledad	Y	2	-	1	3	2	4	2	6
	N	6	8	7	5	6	4	6	2
	?	1	1	1	1	1	1	1	1
Control	Y	-	1	1	1	-	-	-	2
	N	10	9	9	9	10	10	10	9
	?	1	1	1	1	1	1	1	-
Vietnam veterans[a]	Y	5	7	10	15	7	8	1	20
	N	27	25	22	17	25	24	31	11
	?	3	3	-	3	3	3	3	3
Vietnamese	Y	-	-	1	2	1	1	-	3
	N	28	28	27	26	27	27	28	24
	?	5	5	5	5	5	5	5	6

a=one reported chloracne before service in Vietnam

*Y=yes
N=no
?=inconsistent, not answered

skin color change during or after presence in Vietnam, forty-seven reported no such change, twenty respondents gave no answer or an inconsistent answer, and for three respondents an answer could not be determined. Eight of those who described a skin color change indicated it was darker, while nine indicated it was a change to a lighter color.

Hirsutism (excessive hair growth) is an occasional symptom of TCDD exposure. Two respondents reported an increase in the amount of hair during or after presence in Vietnam, sixteen said hair growth had not occurred, and seventy did not answer or gave an inconsistent answer. Sixteen answered that they had experienced a decrease in hair, while two said a decrease in amount of hair had not occurred, and seventy respondents failed to answer or gave an inconsistent answer.

A lighter hair color change occurred to four respondents during or after presence in Vietnam, while four others indicated a change to darker hair color. Fourteen indicated no change in hair color (lighter or darker), and seventy did not answer or answered in an inconsistent manner about lighter or darker hair.

The liver is thought to be the target organ in several laboratory species. This prompted a request for the frequency of the development of liver disease during or after presence in Vietnam. Eleven respondents answered that

liver problems were present. Fifty-five indicated they had no known liver problem, and twenty-two failed to answer.

When queried about a diagnosis of benign or fatty tumors, or cysts, sixteen answered positively. Forty others indicated they had no benign or fatty tumors or cysts while thirty-two failed to answer.

Neuropsychological manifestations are seen in some cases of TCDD exposure. Forty-three of the eighty-eight respondents indicated regular episodes of depression. Twenty-two respondents answered negatively, and twenty-three did not answer. Regular periods of rage were encountered by thirty-three respondents, thirty-two stated they suffered no regular occurrences of rage, and twenty-three did not answer. Forty-eight of the eighty-eight respondents indicated increased anxiety levels. Anxiety did not occur on a regular basis to seventeen respondents, while twenty-three did not answer. An undefined irritability pattern was reported by forty-two respondents, which did not afflict twenty-three of the others, or twenty-three who did not answer the question.

When asked to indicate other emotional states encountered, eight indicated that such problems did occur. Fifty-seven reported no such problems, while twenty-three did not answer the question.

Fifty-three positive responses were elicited for a question inquiring about personality change, noticed by the respondent himself/herself or others. Of the remaining respondents, twenty-six suffered no noticable personality change, and nine did not answer.

A variable designed to test for respondents' "degree of anger" resulted in the following: fifteen reported no rage but irritability, six indicated irritability but no rage, and twenty-seven indicated both rage and irritability. The remaining forty did not answer or the answer was not compatible to computer analysis.

Two additional questions were asked of veterans in Soledad. The only question relevant to their involvement in this study was: Were you ever incarcerated before going to Vietnam? Four answered yes, four answered no, and one did not answer.

Chapter 5

DISCUSSION

The purpose of this study was to produce a non-biased questionnaire for future use. Equally important, as a result of this pilot study, was a culling out of questions which did not produce useful results upon analysis.

It was, largely, a success. The author worked diligently to establish two-way communication with all population segments involved to insure that the pilot study would be a success. This included a series of reviews and evaluations of the questionnaires (Appendices B and E). Such evaluations led to the development of a better designed questionnaire. Discussions before, during, and after administration of the questionnaire have led to many constructive ideas about how to make the next study much more fruitful.

It became obvious that collecting questionnaire data by interviews would further decrease bias. Primary among the reasons to reject questionnaires in any future effort were the number of respondents who did not answer many of the questions; meaning a loss of valuable data.

In part, this was a failure of the questionnaire format. To a larger extent, at least for the Vietnamese

involved, it was the failure to understand a culture. Vietnamese cultural attitudes certainly affected, in unknown ways, the responses of those who took the questionnaire. Several Vietnamese acquaintances of the author explained that questionnaires have not been used to gather information in Vietnam. Conversations with a medical anthropologist who had worked with Vietnamese made it clear that interviews would have been better accepted.

Translation considerations may have slightly biased the responses. Certain English words were not easily translated into Vietnamese, and with the injection of written dialect differences, may have contributed to some misunderstandings.

Most students at ITEC were from Saigon (Ho Chi Minh City) or other large cities of Vietnam. They were, most likely, unexposed to sprayed herbicides, although potentially exposed via drinking water or by having eaten fish and other contaminated foods. Peasants from outlying villages, generally less educated, would not have been allowed to immigrate. Generally speaking, those with money, education and/or professional training or connections, could immigrate.

The author was often told that the questionnaire was too long, both by Vietnamese and Americans. It was suggested that questions relating to Vietnamese respondents' sexual problems would not be answered, due to cultural considerations. On several occasions it was

mentioned to the author that sexual matters were kept strictly to oneself.

A better method of locating Vietnamese by place of residence, in Vietnam, was clearly needed. It was suggested that at least three identifying locations be used, to include: the village name, county name, and city name (a city may be larger than a county).

A purposeful ignorance may have been maintained in Vietnam about the use of chemicals. The AAAS study group was unsuccessful in gathering much information which would have made their tour of South Vietnam much more informative (27). Whether purposeful or not, the Vietnamese people were often just told that the chemicals would kill plants.

As previously mentioned, an introduction was added to the consent form of the Vietnamese version (Appendix F) since it was suggested that many Vietnamese might not know anything about the use of herbicidal chemicals. This was done on the suggestion of several Vietnamese to whom the author talked. These advisors urged that this ignorance might range from not knowing that herbicidal chemicals were used at all, to knowledge of how, when, where, and for what purpose such chemicals were used. An additional suggestion was made to specifically address the issue of the absence of governmental involvement or sponsorship of this research. Some Vietnamese who served as cultural advisors suggested that it be made clear that taking the questionnaire would

not result in any remuneration for harmful effects (perceived or real) suffered as a result of herbicide exposure.

It was a fault not to know who the Vietnamese population was beforehand. Many were too young (below twenty-five), and most were very new to this country. Many may have been suspicious of the author's motives on the topic. Coming from Vietnam, they would tend to be suspicious of authority figures, or those they perceived as in authority.

For many Vietnamese who had supported the U.S. during the war, the use of herbicides was a very delicate political issue; one which they did not wish to delve into. The very political nature of the whole war among some Vietnamese was made very clear.

A Vietnamese friend of the author volunteered to come to the afternoon classes at ITEC to assist. Whether this bore fruit in terms of building confidence in the investigator among the Vietnamese respondents is unknown.

Cultural issues relating to the questionnaire were educational experiences for the author. One such example relates to birth defects. Retrospective studies of birth defects among Vietnamese, using figures from Vietnam, are bound to be somewhat flawed. The birth of a deformed child in Vietnam represents a lose of face (13). It can be expected that no accurate, baseline, birth defects figures

will come from Vietnamese hospitals, nor will defects be self-reported.

The basic inability of an investigator to assign causal status to the many possible causes of the problems of Vietnam veterans and Vietnamese is well documented. For example, CDC (1) states:

> The underlying problem is that the use of herbicide was not equally distributed in Vietnam. Areas where it was heavily used were generally combat areas and differed in terrain and flora from those areas where it was little used. These areas may also have differed in other important respects, such as, indigenous diseases, level of combat intensity, and type of personnel deployed.

The National Research Council (NRC) had already listed some of the variables complicating the cause and effect formula in 1982. They wrote:

> A partial list includes exposure to insect repellents, insecticides, water purification chemicals, antimalarial drugs, petroleum distillates including napalm, weapons residues, chemical weapons, beverage alcohol, illegal narcotics, liquid hexachlorophene soaps, immunizations, food contaminants, dioxin-containing pentachlorophenol (for wood preservation) and a variety of viral, bacterial, fungal and parasitic diseases and their therapies (56).

An additional complicating factor for all investigations includes, "the discrepancy in the amount of herbicides shipped vs. amount used vs. HERBS tapes (official inventory of herbicide operations) figures" (13). The HERBS tapes did not include pre-August, 1965, missions, some helicopter missions, some herbicide flights which had to dump their loads, and some other minor uses of herbicides.

Investigations revealed that Agents Pink and Green, herbicides used prior to Agent Orange, contained up to 65.6 ppm TCDD; approximately twice the level of TCDD discovered in samples of Agent Orange. Therefore, according to Young (15), approximately 39% of TCDD was sprayed before the HERBS tapes were established.

An unknown amount of TCDD would have been photodegraded; a fairly well described process (15). The photodegradation process involves dechlorination of the TCDD molecule in ultraviolet light, and possibly in its absence.

Telephone communication with the Chronic Diseases section of CDC in Atlanta, Georgia, on April 21, 1986, confirmed that two of the three important studies, over which CDC has responsibility, are on-going. These are the "Vietnam Experience" study and the "Selected Cancers" study. The other major effort, the "Agent Orange" study, has been put "on hold," according to Robert C. Diefenbach, a public health advisor to the CDC's Agent Orange Projects (57). The problem involves how to better assess exposure. This follows at least two years of previous work on this study, and several years of VA efforts.

A study of women veterans has been suggested. It would assess medical problems women might demonstrate (see teratology discussion in "Literature Cited"). CDC has prepared a draft protocol for such a study and has advised Congress that they are prepared to move ahead (57). Such

studies could be correlated to completed studies on males to determine causal association of specific variables between the sexes. The study of women veterans awaits government funding, which points up another problem in getting to any causal factors--the vagaries of government funding.

It was and is, perhaps, a mistake for any investigator to use chloracne as a clinically acceptable marker of exposure to TCDD, in the absence of known contact with the chemical. Hoffman, et al (58), reported the results of comprehensive medical exams during late 1984 and early 1985, on 154 Missourians exposed to TCDD-laden waste oil sprayed on roads for dust control in 1971. Study controls were 155 unexposed local Missourians. No chloracne was reported among the exposed subjects. However, "Despite the lack of overt illness in exposed participants in this study, the results suggest that TCDD exerts effects in the absence of chloracne."

This will prove to be a major complicating factor when analyzing past studies which depended on the presence of chloracne as the sole indication of TCDD exposure. Obviously, the conclusion of this CDC-sponsored investigation impacts on the results of the study at hand.

Over the last few years, Arnold Schecter of the State University of New York Medical Center in Binghamton, has shed additional light and caused additional problems for researchers studying Vietnam veterans and Vietnamese to

discern TCDD-induced effects.

In a study of the levels of chlorinated dibenzo-p-dioxins in human adipose tissue and milk samples from Vietnamese (north and south), Schecter, et al (59) found no detectable TCDD in adipose tissue of nine patients from North Vietnam. Twelve of fifteen adipose samples from South Vietnam exhibited a mean of twenty-eight parts per million (ppm).

Weerasinghe (60), in association with Schecter and others, found levels of TCDD in most adipose tissue samples from Vietnam veterans (who sought medical assistance) and a group of control patients. The controls had no known exposure to TCDD-contaminated herbicides or other materials, but levels of TCDD between two and fourteen ppt were detected in both veterans and controls.

Finally, Ryan (61), again in cooperation with Schecter and others, found TCDD (in ppt levels) in all fat samples from three deceased subjects. Lower levels of other chlorinated dibenzo-p-dioxins (and furans) were found in all of ten different tissue types analyzed. Their findings suggest that the chlorinated dioxins and furans, "are being stored in the lipid and not undergoing rapid metabolism and elimination (61)."

The difficulty presented by these data to investigators is that there are no "control" populations available with which to compare Vietnam veterans. The only people found

with no detectable levels of TCDD are those living in the north of Vietnam. It is therefore clear that investigators must now turn their attention to studies of TCDD effects on Vietnam. Control populations, in the strictest sense, can not be found among the population of industrialized countries.

Until an informed decision on the availability of control populations can be made, the individual investigator may wish to continue his or her studies. This is the case with the study at hand. Such studies may, in fact, help illuminate the control population dilemma.

While the author acknowledges complaints about the length of the questionnaire, the difficulty of separating variable effects from herbicide effects is also recognized. The length of the questionnaire, possibly excessive, could not have been shortened and remained a useful tool.

It was clear that some questions were not as helpful as others. For example, some responses were inconsistent with previous responses. This may have been a matter of definitions, confusion, or lack of information. It is possible that the advantages of interviews might have served to lessen, or eliminate, inconsistent answers.

Some questions related to physical symptoms deserve more in-depth study. The physical (and mental) health of pre- and post-Vietnam children deserves more research. The position of chloracne on the body did not confirm past

research, but in consideration of the results given by Hoffman, this may not be too bothersome. Photosensitivity of the body appears to be an area which would benefit by further research. While many respondents answered "no" to the presence of benign or fatty tumors or cysts, what appears to be an excessive number (given sample size) answered "yes."

Answers to questions relating to the mental health of the respondents were startling. Both groups, Vietnam veterans and Vietnamese, appear to have major psychological difficulties. Responses confirm the results of two studies the author read. The first, the Asian Health Assessment Project of the Santa Clara County Health Department, found, "The Vietnamese group also showed very significantly increased proportions in need of mental health services..." (62). The second, by Lin, Carter, and Kleinman, found depression among Vietnamese refugees to be very high (about fifty per cent). Illness of psychosomatic origin (somatization) was found to be, "one of the most important clinical problems in Asian refugees... may also reflect a poor underlying psychological health status (63)."

The results of the two studies just presented are confirmed by the data gathered by the author and appear to re-inforce the need for further study of the psychological dimension. Future studies will be required to determine if these mental difficulties relate to herbicide exposure or

the migration experience.

The United States owes it to the veterans of the Vietnam War, who served their country when asked, to re-establish relations with Vietnam and to initiate cooperative studies which may address, finally, the reasons Vietnam veterans have had the extreme difficulties in health and re-adjustment to civilian life.

The United States also owes our largest group of new immigrants, the Vietnamese, those cooperative studies. Most Vietnamese were truly innocent victims of a vicious war.

This investigator hopes to continue, in some capacity, to be of help in this matter. Whether this might entail future involvement in cooperation with the Centers for Disease Control, using the epidemiologic instrument just developed, remains to be seen. The author plans to maintain contact with the CDC.

REFERENCES

1. Protocol for epidemiologic studies of the health of Vietnam veterans. U.S. Department of Health and Human Services(CDC, Public Health Service), 1983.

2. Centers for Disease Control. Health status of Indochinese Refugees. MMWR 1979;28:385-398.

3. Barrett-Connor E. Latent and chronic infections imported from Southeast Asia. JAMA 1978;239:1901-1906.

4. Krieger L. Today's immigrants no longer seen as public health threat. American Medical News 1984 (Sept. 21):3-10.

5. Erickson RV, Hoang GN. Health problems among Indochinese refugees. Am J Public Health 1980;70:1003-1005.

6. Stevens KM. Agent orange toxicity: a quantitative perspective. Human Toxicol 1981;1:31-39.

7. Epstein SS. Agent orange diseases: problems of causality, burdens of proof and restitution. Trial 1983;19:91-99.

8. Kociba RJ, Schwetz BA. Toxicity of 2,3,7,8-tetrachloro-dibenzo-p-dioxin(TCDD). Drug Metabolism Reviews 1982;13 (3):387-406.

9. Poiger H, Schlatter CH. Animal toxicology of chlorinated dibenzo-p-dioxins. Chemosphere 1983;12:453-462.

10. Huff JE, Moore JA, Saracci R, et al. Long-term hazards of polychlorinated dibenzodioxins and polychlorinated dibenzofurans. Env Health Persp 1980;36:221-240.

11. Reggiani G. Toxicology of 2,3,7,8-tetrachlorodibenzo-p-dioxin(TCDD): short review of its formation, occurence, toxicology, and kinetics, discussing human health effects, safety measures, and disposal. Regulatory Toxicology and Pharmacology 1981;1:211-243.

12. Kitchin KT, Woods JS. 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD) effects on hepatic microsomal cytochrome P-448-mediated enzyme activities. Toxicol Appl Pharmacol 1979; 47:537-546.

13. National Academy of Sciences. The effects of herbicides in South Vietnam. Washington, 1974.

14. Murphy SD. Pesticides. In J. Doull, C. Klaassen, M. Amdur (eds.). Toxicology: the basic science of poisons, 2nd ed. Macmillan Publishing Co, Inc, New York, pp. 357-408.

15. Young AL, Calcagni JA, Thalken CE, et al. The toxicology, environmental fate and human risk of herbicide orange and its associated dioxin. Washington, U.S. Air Force, 1978.

16. Calesnick B. Dioxin and agent orange. Am Fam Physician 1984;29:303-305.

17. Buckingham WA Jr. Operation ranch hand: the Air Force and herbicides in Southeast Asia 1961-1971. Washington: U.S. Air Force Office of Air Force History, 1982.

18. Anonymous. The USAF "deniability" factor: spraying was obliterated. Citizen Soldier 1983;5:7.

19. Dan BB. Vietnam and birth defects (editorial). JAMA 1984;252:936-937.

20. Schneider M. Persistent poisons: chemical pollutants in the environment. New York, New York Academy of Sciences, 1979.

21. Smith J. EPA halts most use of herbicide 2,4,5-T. Science 1979;203:1090-1091.

22. Cookson C. 'Emergency' ban on 2,4,5-T herbicide in US. Nature 1979;278:108-109.

23. Neilands JB, Orians GH, Pfeiffer EW, et al. Harvest of death. New York, The Free Press, 1972.

24. Westing AH. Herbicides in war: the long-term ecological and human consequences. Phildelphia, Taylor & Francis, Inc., 1984.

25. Congressional Research Service. Dioxin: environmental impacts and potential human health effects (IB83079). Washington: Library of Congress, 1983.

26. Epstein SS. Testimony on agent orange and HR6377 before the House Subcommittee on medical facilities and benefits of the Committee on Veterans' Affairs. July, 1980.

27. Orians GH, Pfeiffer EW. Ecological effects of the war in Vietnam. Science 1970;168:544-554.

28. Donovan JW, MacLennan R, Adena M. Vietnam service and the risk of congenital anomalies: a case-control study. Med J Aust 1984;140:394-397.

29. Can N. Effects on offspring of paternal exposure to herbicides. In A. Westing (ed.). Herbicides in War: the long-term ecological and human consequences. Philadelphia, Taylor & Francis, Inc., 1984, pp 137-139.

30. Firkin FC, Mariani AF. Agranulocytosis due to dapsone. The Medical Journal of Australia 1977;2:247-251.

31. Neel S. Medical support of the U.S. Army in Vietnam 1965-1970. Washington: Department of the Army, 1973.

32. Poland A, Knutson JC. 2,3,7,8-tetrachlorodibenzo-p-dioxin and related halogenated aromatic hydrocarbons: examination of the mechanism of toxicity. Ann Rev Pharmacol Toxicol 1982;22:517-554.

33. Beljan JR, Irey NS, Kilgore WW, et al. The health effects of "agent orange" and polychlorinated dioxin contaminants: an update, 1984. Chicago, American Medical Association, 1984.

34. Crow K. Chloracne: the chemical disease. New Scientist 1978;78:78-80.

35. Sittig M. Handbook of toxic and hazardous chemicals. New Jersey, Noyes Publications, 1981.

36. Meselson M, Baughman R. An analytical method for detecting TCDD: levels of TCDD in Vietnam. Env Health Persp 1973;5:27-36.

37. Brodkin RH, Schwartz RA. Cutaneous signs of dioxin exposure. Am Fam Physician 1984;30:189-194.

38. May G. Tetrachlorodibenzodioxin: a survey of subjects ten years after exposure. Br J Ind Med 1982;39:128-135.

39. Huff JE, Moore JA, Saracci R, et al. Long-term hazards of polychlorinated dibenzodioxins and polychlorinated dibenzofurans. Env Health Persp 1980;36:221-240.

40. Moses M, Lilis R, Crow KD, et al. Health status of workers with past exposure to 2,3,7,8-tetrachloro-dibenzo-p-dioxin in the manufacture of 2,4,5-Trichloro-phenoxyacetic acid: comparison of findings with and without chloracne. Am J Ind Med 1984;5:161-182.

41. Suskind RR, Hertzberg VS. Human health effects of 2,4,5-T and its toxic contaminants. JAMA 1984;251:2372-2380.

42. U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, National Institute for Occupationsl Safety and Health (NIOSH). 2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD, "dioxin"). (Current Intelligence Bulletin 40). Washington,DC: US GPO, 1984.

43. Van DD. Herbicides as a possible cause of liver cancer. In A. Westing (ed.). Herbicides in War: the long-term ecological and human consequences. Phildelphia, Taylor & Francis, Inc., 1984, pp 119-121.

44. Dwyer JH, Epstein SS. Cancer and clinical epidemiology: an overview. In A. Westing (ed.). Herbicides in War: the long-term ecological and human consequences. Phildelphia, Taylor & Francis, Inc., 1984, pp 123-129.

45. International Agency for Research on Cancer, IARC. Monographs on the evaluation of carcinogenic risk of chemicals to man: some fumigants, the herbicides 2,4-D and 2,4,5-T, chlorinated dibenzodioxins and miscellaneous industrial chemicals. Vol. 15 pp 41-103, 1977.

46. Weisburger JH, Williams GM. Chemical carcinogens. In J. Doull, C. Klaassen, M. Amdur (eds.). Toxicology: the basic science of poisons, 2nd ed. Macmillan Publishing Co, Inc, New York, pp 84-138.

47. Hay AWM. Experimental toxicology and cytogenetics: an overview. In A. Westing (ed.). Herbicides in War: the long-term ecological and human consequences. Phildelphia, Taylor & Francis, Inc., 1984, pp 161-166.

48. Harbison, RD. Teratogens. In J. Doull, C. Klaassen, M. Amdur (eds.). Toxicology: the basic science of poisons, 2nd ed. Macmillan Publishing Co, Inc., New York, pp 158-175.

49. Centers for Disease Control. Vietnam veterans' risks for fathering babies with birth defects. MMWR 1984;30:457-459.

50. Pearn JH. Teratogens and the male: an analysis with special reference to herbicide exposure. Med J Aust 1983; 2:16-20.

51. Fry TJ. 2,4,5-trichlorophenoxyacetic acid induced, lethal mutations in Drosophila melanogaster (M.A. thesis). San Jose State University, May, 1976.

42. U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, National Institute for Occupationsl Safety and Health (NIOSH). 2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD, "dioxin"). (Current Intelligence Bulletin 40). Washington,DC: US GPO, 1984.

43. Van DD. Herbicides as a possible cause of liver cancer. In A. Westing (ed.). Herbicides in War: the long-term ecological and human consequences. Phildelphia, Taylor & Francis, Inc., 1984, pp 119-121.

44. Dwyer JH, Epstein SS. Cancer and clinical epidemiology: an overview. In A. Westing (ed.). Herbicides in War: the long-term ecological and human consequences. Phildelphia, Taylor & Francis, Inc., 1984, pp 123-129.

45. International Agency for Research on Cancer, IARC. Monographs on the evaluation of carcinogenic risk of chemicals to man: some fumigants, the herbicides 2,4-D and 2,4,5-T, chlorinated dibenzodioxins and miscellaneous industrial chemicals. Vol. 15 pp 41-103, 1977.

46. Weisburger JH, Williams GM. Chemical carcinogens. In J. Doull, C. Klaassen, M. Amdur (eds.). Toxicology: the basic science of poisons, 2nd ed. Macmillan Publishing Co, Inc, New York, pp 84-138.

47. Hay AWM. Experimental toxicology and cytogenetics: an overview. In A. Westing (ed.). Herbicides in War: the long-term ecological and human consequences. Phildelphia, Taylor & Francis, Inc., 1984, pp 161-166.

48. Harbison, RD. Teratogens. In J. Doull, C. Klaassen, M. Amdur (eds.). Toxicology: the basic science of poisons, 2nd ed. Macmillan Publishing Co, Inc., New York, pp 158-175.

49. Centers for Disease Control. Vietnam veterans' risks for fathering babies with birth defects. MMWR 1984;30:457-459.

50. Pearn JH. Teratogens and the male: an analysis with special reference to herbicide exposure. Med J Aust 1983; 2:16-20.

51. Fry TJ. 2,4,5-trichlorophenoxyacetic acid induced, lethal mutations in Drosophila melanogaster (M.A. thesis). San Jose State University, May, 1976.

52. Trung CB, Dieu VV. Chromosomal aberrations in humans following exposure to herbicides. In A. Westing (ed.). Herbicides in War: the long-term ecological and human consequences. Philadelphia, Taylor & Francis, Inc., 1984, pp 157-159.

53. Evans JJA. Spraying of pesticides in Vietnam (testimony submitted to Senate Standing Committee on Science and the Environment, A.C.T.). March, 1982.

54. Yager T, Laufer R, Gallops M. Some problems associated with war experience in men of the Vietnam generation. Archives of General Psychiatry 1984;41:327-333.

55. Rawls R. Dioxin's human toxicity is most difficult problem. Chemical & Engineering News 1983;61:37-48.

56. National Research Council. Effects of exposure to agent orange on ground troops in Vietnam. Washington, DC, 1982.

57. Personal communication, April 21, 1986.

58. Hoffman RE, Stehr-Green PA, Webb KB, et al. Health effects of long-term exposure to 2,3,7,8-Tetrachloro-dibenzo-p-dioxin. JAMA 1986;255:2031-2038.

59. Schecter AJ, Ryan JJ, Constable JD. Chlorinated dibenzo-p-dioxin and dibenzofuran levels in human adipose tissue and milk samples from the north and south of Vietnam. Chemosphere 1986 (in press).

60. Weerasinghe NCA, Schecter AJ, Pan JC, et al. Levels of 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD) in adipose tissue of U.S. Vietnam veterans seeking medical assistance. Chemosphere 1986 (in press).

61. Ryan JJ, Schecter AJ, Sun W, et al. Distribution of chlorinated dibenzo-p-dioxins and chlorinated dibenzofurans in human tissues from the general population. In C. Rappe, G. Choudhary, L.H. Keith (eds.) Chlorinated Dioxins and Dibenzofurans in the Total Environment. Lewis Publishing Co., 1986 (in press).

62. Meinhardt K, Tom S, Tse P, et al. Asian Health Assessment Project (Santa Clara County Health Department), August 3, 1984.

63. Lin EHB, Carter WB, Kleinman AM. An Exploration of

52. Trung CB, Dieu VV. Chromosomal aberrations in humans following exposure to herbicides. In A. Westing (ed.). Herbicides in War: the long-term ecological and human consequences. Philadelphia, Taylor & Francis, Inc., 1984, pp 157-159.

53. Evans JJA. Spraying of pesticides in Vietnam (testimony submitted to Senate Standing Committee on Science and the Environment, A.C.T.). March, 1982.

54. Yager T, Laufer R, Gallops M. Some problems associated with war experience in men of the Vietnam generation. Archives of General Psychiatry 1984;41:327-333.

55. Rawls R. Dioxin's human toxicity is most difficult problem. Chemical & Engineering News 1983;61:37-48.

56. National Research Council. Effects of exposure to agent orange on ground troops in Vietnam. Washington, DC, 1982.

57. Personal communication, April 21, 1986.

58. Hoffman RE, Stehr-Green PA, Webb KB, et al. Health effects of long-term exposure to 2,3,7,8-Tetrachloro-dibenzo-p-dioxin. JAMA 1986;255:2031-2038.

59. Schecter AJ, Ryan JJ, Constable JD. Chlorinated dibenzo-p-dioxin and dibenzofuran levels in human adipose tissue and milk samples from the north and south of Vietnam. Chemosphere 1986 (in press).

60. Weerasinghe NCA, Schecter AJ, Pan JC, et al. Levels of 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD) in adipose tissue of U.S. Vietnam veterans seeking medical assistance. Chemosphere 1986 (in press).

61. Ryan JJ, Schecter AJ, Sun W, et al. Distribution of chlorinated dibenzo-p-dioxins and chlorinated dibenzofurans in human tissues from the general population. In C. Rappe, G. Choudhary, L.H. Keith (eds.) Chlorinated Dioxins and Dibenzofurans in the Total Environment. Lewis Publishing Co., 1986 (in press).

62. Meinhardt K, Tom S, Tse P, et al. Asian Health Assessment Project (Santa Clara County Health Department), August 3, 1984.

63. Lin EHB, Carter WB, Kleinman AM. An Exploration of

Somatization among Asian Refugees and Immigrants in Primary Care. Am J Public Health 1985;75:1080-1084.

APPENDIX A

TABLE 1.—MAJOR HERBICIDE MIXTURES USED IN VIETNAM

Military Color Code or Trade Name[*]	*Composition (active ingredients)*
Pink	60% n-butyl ester of 2,4,5-T
	40% isobutyl ester of 2,4,5-T
Green	100% n-butyl ester of 2,4,5-T
Pink-Green mixture	80% n-butyl ester of 2,4,5-T
	20% isobutyl ester of 2,4,5-T
Dinoxol	50% butyoxyethanol ester of 2,4-D
	50% butyoxyethanol ester of 2,4,5-T
Trinoxol	100% butyoxyethanol ester of 2,4,5-T
Purple	50% n-butyl ester of 2,4-D
	30% n-butyl ester of 2,4,5-T
	20% isobutyl ester of 2,4,5-T
Blue	100% sodium salt of cacodylic acid
Orange	50% n-butyl ester of 2,4-D
	50% n-butyl ester of 2,4,5-T
Orange II	50% n-butyl ester of 2,4-D
	50% isooctyl ester of 2,4,5-T
White	80% triisopropanolamine salt of 2,4-D
	20% triisopropanolamine salt of picloram

Source: The Committee on the Effects of Herbicides in Vietnam, National Research Council, *The Effects of Herbicides in South Vietnam: Part A* (Washington, D.C.: National Academy of Sciences, 1974), p II-4; rprt, Review and Evaluation of ARPA "Defoliation" Program in South Vietnam [1962], pp 31-32; rprt, Capt. Alvin L. Young, *et al*, USAF Occupational and Environmental Health Laboratory, The Toxicology, Environmental Fate, and Human Risk of Herbicide Orange and Its Associated Dioxin, Oct. 78, p I-7 (hereafter cited as USAF OEHL Report).

[*]Herbicide drums were identified by a four-inch-wide circular band of paint colored in correspondence with these color codes.

TABLE 2.—HERBICIDE DISSEMINATED IN SOUTH VIETNAM JAN 1962-DEC 1964

Military Herbicide	*Gallons of Formulation*	*Pounds Active Ingredient*
Blue	5,200	10,000
Green	8,208	66,980
Pink	122,792	1,001,980
Purple	145,000	1,180,300
Total	281,200	2,259,260

Source: USAF OEHL Report, p I-9.

APPENDIX B

3. ETHNIC ORIGIN: (1)Caucasian[37] (2)Black[5] (3)Hispanic [7]
(4)Asian[0] (5)American Indian[4] (6)Other [2] _____
specify

4. WHAT IS YOUR PRESENT OCCUPATION? (1)Skilled Labor [8]
(2)Professional[15] (3)Technical[2] (4)Agricultural/forestry [0]
(5)Other [28] _____
specify (e.g., unemployed, in job training, homemaker, etc.)

5. DID YOU SERVE IN THE MILITARY? (1)Yes[54] (2)No[1]

If NO, please go on to question #11, page 3

6. WHICH BRANCH OF THE SERVICE WERE YOU IN? (1)Army[34]
(2)Air Force[3] (3)Marines[8] (4)Navy[10]
(5)Civilian employee (e.g., Red Cross, U.S.O., A.I.D., etc.)[0]

7. DID YOU EVER SERVE IN VIETNAM? (1)Yes[45] (2)No[11]

8. IF YES TO #7, PLEASE INDICATE DURING WHICH PERIODS YOU WERE IN VIETNAM.

From _____ _____ TO _____ _____
month year month year

If you served a second tour of duty in Vietnam, please indicate when, below.

From _____ _____ TO _____ _____
month year month year

9. DID YOU SERVE OUTSIDE THE U.S. (other than in Vietnam) FOR MORE THAN SIX (6) MONTHS?

(1)Yes [24](2)No[25] (3)Not applicable[3]

If YES where did you serve for the longest period of time?

_____
location

Date _____ _____ TO _____ _____
month year month year

10. TO YOUR KNOWLEDGE, WERE AGRICULTURAL CHEMICALS (e.g., herbicides) USED IN THIS AREA?

(1)Yes[25] (2)No [4] (3)Don't know[18] NA [9]

If YES, do you know what agricultural chemicals were used, and for how long?

chemical used	length of use

WERE YOU DIAGNOSED AS HAVING ANY OF THE FOLLOWING INFECTIOUS DISEASES WHILE LIVING OR SERVING IN VIETNAM, AND DID YOU RECEIVE TREATMENT? [NOTE: these questions may require two (2) answers]

		DIAGNOSED? YES	DIAGNOSED? NO	[NA]	[NA]	TREATED? YES	TREATED? NO
11.	Intestinal worms	(1)[10]	(2)[53]	[25]	[7]	(3) [5]	(4)[12]
12.	Tuberculosis	(1)[3]	(2)[56]	[29]	[77]	(3) [0]	(4)[11]
13.	Serum Hepatitis (Hepatitis B)	(1) [5]	(2) [55]	[29]	[73]	(3) [3]	(4) [12]
14.	Infectious Hepatitis (Hepatitis A)	(1) [1]	(2) [58]	[29]	[77]	(3) [0]	(4) [11]
15.	Amebic or bacterial dysentery	(1) [11]	(2) [49]	[28]	[69]	(3) [5]	(4) [14]
16.	Venereal Disease	(1)[11]	(2)[48]	[29]	[69]	(3) [10]	(4)[9]
17.	Malaria	(1) [13]	(2) [52]	[23]	[69]	(3) [9]	(4) [10]

18. IF TREATMENT WAS RECEIVED FOR MALARIA, WAS DAPSONE GIVEN?

(1)Yes[2] (2)No[10] (3)Don't know[13] NA [63]

19.	Other_____ specify	(1)	(2)	(3)	(4)
20.	Other_____ specify	(1)	(2)	(3)	(4)

OCCUPATIONAL ENVIRONMENT: SINCE LEAVING VIETNAM, TO YOUR KNOWLEDGE, HAVE YOU BEEN EXPOSED ON A REGULAR BASIS TO:

21. Chemicals? (1)Yes[10] (2)No[40] (3)Don't know[28] NA [10]

22. Radiation? (1)Yes[4] (2)No[44] (3)Don't know[30] NA [10]

IF YOU ANSWERED NO TO NUMBERS 21 AND 22, GO ON TO #27.

IF YOU ANSWERED YES TO EITHER OR BOTH OF THE ABOVE, PLEASE ANSWER NUMBERS 23 THROUGH 26.

23. HAVE YOU BEEN EXPOSED TO CHEMICALS, AT A PLACE OF EMPLOYMENT, WITHIN THE LAST YEAR?

(1)Yes[9] (2)No[18] (3)Don't know[12] NA [49]

24. HAVE YOU BEEN EXPOSED TO CHEMICALS, AT A PLACE OF EMPLOYMENT, WITHIN THE LAST TWO (2) TO TEN (10) YEARS?

(1)Yes[15] (2)No[11] (3)Don't know[12] NA [50]

25. HAVE YOU BEEN EXPOSED TO RADIATION (except dental or chest x-rays) WITHIN THE LAST YEAR?

(1)Yes[6] (2)No[22] (3)Don't know[10] NA [50]

If YES, from what source and for how long were you exposed?

_____

26. HAVE YOU BEEN EXPOSED TO RADIATION (except dental or chest x-rays) WITHIN THE LAST TWO (2) TO TEN (10) YEARS?

(1)Yes[4] (2)No[22] (3)Don't know[15] NA [47]

If YES, from what source and for how long were you exposed?

_____

OTHER EXPOSURES:

27. HAVE YOU BEEN EXPOSED TO A CHEMICAL(S) IN THE LAST TEN (10) YEARS WHILE PRACTICING A HOBBY OR WHILE DOING OTHER ACTIVITIES AT HOME OR IN OTHER NON-OCCUPATIONAL SETTINGS (Please refer to attached list "A")?

(1)Yes[12] (2)No[36] (3)Don't know[21] NA [19]

If YES to #27, please list the three (3) most common chemical exposures in non-work settings during the last ten (10) years.

_____

chemical duration of exposure how often exposed

_____

chemical duration of exposure how often exposed

_____

chemical duration of exposure how often exposed

PERSONAL HABITS:

28. HAVE YOU EVER USED TOBACCO PRODUCTS? (1)Yes[61] (2)No[26] NA [1]

29. IF YOU ANSWERED YES TO #28, WHICH TOBACCO PRODUCTS WERE USED?

(1)Cigarettes [58] (2)Cigars [9] (3)Pipe [7] (4)Chewing tobacco [4]
(5)All of the above [1] (6)Other [0]

30. DO YOU CURRENTLY USE TOBACCO PRODUCTS? (1)Yes[43] (2)No[42] NA [3]

If YES, how long have you used these products?_____

31. IF YOU ANSWERED YES TO #30, HOW MUCH DO YOU USE?

(1)Less than 1 pack/day[30] (2)Between 2 to 4 packs/day [12]

(3)More than 4 packs/day[0] (4)1 to 3 pinches or pouches/day [1]

(5)A cigar or pipeful/day[1] (6)More than a cigar or pipeful/day[2]

32. DO YOU DRINK BEER? (1)Yes [46] (2)No[38] NA [4]

33. IF YES TO #32, HOW MUCH BEER DO YOU DRINK?

(1)Less than 6 cans or bottles/day [40]

(2)6 to 12 cans or bottles/day [4] NA [43]

(3)More than 12 cans or bottles/day[1]

34. DO YOU DRINK HARD LIQUOR? (1)Yes [36] (2)No[48] NA [4]

35. IF YES TO #34, HOW MUCH HARD LIQUOR DO YOU DRINK?

(1)Less than 2 drinks/day[29] (2)2 to 5 drinks/day[2]

(3)More than 5 drinks/day[3] NA [54]

36. DO YOU DRINK WINE? (1)Yes [46] (2)No[37] NA [5]

37. IF YES TO #36, HOW MANY GLASSES PER DAY?

(1)Less than 2 glasses/day[32] (2)2 to 5 glasses/day[3]

(3)More than 5 glasses/day[1] NA [52]

GENETIC HISTORY:

38. ANY BIRTH DEFECTS, GENETIC DISORDERS, OR INHERITED DISEASES DIAGNOSED AFFECTING YOU OR YOUR FAMILY?

(1)Yes[19] (2)No[64] NA [5]

If YES, please specify_____

39. ANY BIRTH DEFECTS, GENETIC DISORDERS, OR INHERITED DISEASES DIAGNOSED AFFECTING THE FAMILY OF ANY MATE WITH WHOM YOU HAVE HAD A CHILD?

(1)Yes[3] (2)No[61] (3)Don't know[15] NA [9]

If YES, please specify_____

40. HAVE YOU AND YOUR MATE HAD DIFFICULTY CONCEIVING (trying unsuccessfully for 1 year) OR BEEN DIAGNOSED AS BEING INFERTILE?

(1)Yes[15] (2)No[60] NA [13]

If YES, please specify_____

41. DID YOU HAVE CHILDREN BEFORE SERVICE IN VIETNAM?

(1)Yes[18] (2)No[64] NA [6]

42. IF YES TO #41, WERE/ARE THEY PHYSICALLY AND MENTALLY HEALTHY?

(1)Yes[15] (2)No[9] NA [64]

If NO, please specify_____

43. HAVE YOU HAD CHILDREN AFTER SERVICE IN VIETNAM?

(1)Yes[40] (2)No[41] NA [7]

44. IF YES TO #43, WERE/ARE THEY PHYSICALLY AND MENTALLY HEALTHY?

(1)Yes[27] (2)No[14] NA [47]

If NO, please specify_____

HEALTH HISTORY:

45. DID YOU EVER HAVE ACNE AS A YOUTH? (1)Yes[43] (2)No[42] NA [3]

46. DID IT CLEAR UP? (1)Yes[45] (2)No[6] NA [37]

47. DID YOU EVER HAVE ACNE AS AN ADULT? (1)Yes[42] (2)No[41] NA [5]

48. DID YOU EVER HAVE AN ACNE-LIKE OUTBREAK DURING SERVICE IN VIETNAM?

(1)Yes[18] (2)No[47] (3)Don't recall[16] NA [7]

49. DID YOU EVER HAVE AN ACNE-LIKE OUTBREAK AFTER SERVICE IN VIETNAM?

(1)Yes[31] (2)No[39] (3)Don't recall[10] NA [8]

50. IF YOU ANSWERED YES TO #48 OR #49 ABOVE, WHERE DID IT OCCUR? [NOTE: more than 1 answer may be required]

(1)Under your eyes[7] (2)On your arms[10] (3)On your trunk[21]

(4)On your neck[13] (5)Behind your ears[8] (6)On your feet[3]

(7)On your legs[13]

51. HAVE YOU EVER EXPERIENCED A CHANGE IN YOUR SKIN COLOR (unrelated to sunburning)?

(1)Yes[21] (2)No[47] (3)Don't know[12] NA [8]

52. IF YOU ANSWERED YES TO #51, DID YOUR SKIN BECOME

(1)Lighter[12] (2)Darker[11] NA [65]

53. DID IT OCCUR (1)Before[0] (2)During[6] (3)After[14] YOUR SERVICE IN VIETNAM? NA [68]

54. HAVE YOUR EYES BEEN MORE SENSITIVE THAN NORMAL TO LIGHT?

(1)Yes[47] (2)No[25] (3)Don't know[11] NA [5]

55. DID IT OCCUR (1)Before[2] (2)During[7] (3)After[32] YOUR SERVICE IN VIETNAM? NA [47]

56. HAS ANY OTHER PART OF YOUR BODY SHOWN AN INCREASED SENSITIVITY TO LIGHT?

(1)Yes[17] (2)No[38] (3)Don't recall[23] NA [10]

57. IF YES TO #56, HAVE YOU DEVELOPED ANY OF THE FOLLOWING?

(1)Blisters[7] (2)Sores[2] (3)Worsening of rash[15] NA [61]

(4)Other[3] _____

58. HAVE YOU EVER NOTICED A CHANGE IN YOUR HAIR COLOR OR PATTERN (beyond normal balding)?

(1)Yes[20] (2)No[50] (3)Don't recall[10] NA [8]

59. IF YES TO #58, WHAT DID YOU NOTICE? [NOTE: more than 1 answer may be required]

(1)More hair[4] (2)Less hair[16] (3)Lighter hair[8] (4)Darker hair [7]

60. DID THIS OCCUR YOUR SERVICE IN VIETNAM? (1)Before[0] (2)During[4] (3)After[19] NA [65]

HAVE YOU EVER BEEN TOLD BY A DOCTOR THAT YOU HAD ANY OF THE FOLLOWING CONDITIONS? PLEASE INDICATE THE YEAR THAT THE CONDITION FIRST BEGAN.

		YES	NO	YEAR DIAGNOSED?
61.	Hay fever	(1)[27]	(2)[43]	NA [18]
62.	Allergies	(1)[23]	(2)[42]	NA [23]
63.	High blood pressure	(1)[20]	(2)[42]	NA [26]
64.	Heart condition	(1)[3]	(2)[57]	NA [28]
65.	Epilepsy	(1)[2]	(2)[59]	NA [27]
66.	Kidney disease	(1)[6]	(2)[56]	NA [26]
67.	Anemia	(1)[6]	(2)[56]	NA [26]
68.	Liver condition/ disease	(1)[12]	(2)[54]	NA [22]

_____ please specify

69.	Benign, fatty tumors or cysts	(1)[16]	(2)[40]	NA [32]

_____ please specify

70.	Other tumors or cancer	(1)[4]	(2)[45]	NA [38]

_____ please specify

GENERAL HEALTH:

71. DO YOU SLEEP WELL? (1)Yes[45] (2)No[43] NA [1]

72. HAVE YOU LOST 20 OR MORE POUNDS, SINCE LEAVING VIETNAM, WITH NO CHANGE IN YOUR DIET?

(1)Yes [23] (2)No[56] NA [9]

73. SINCE LEAVING VIETNAM, HAVE YOU EVER EXPERIENCED LOSS OF APPETITE?

(1)Yes [49] (2)No[32] NA [7]

74. HAVE YOU OR YOUR FAMILY NOTICED A PERSONALITY CHANGE IN YOU SINCE YOUR RETURN FROM VIETNAM?

(1)Yes [53] (2)No[26] NA [9]

75. DO YOU REGULARLY (not just once in awhile) SHOW SIGNS OF THE FOLLOWING SINCE YOUR RETURN FROM VIETNAM?
[NOTE: more than 1 response may be needed]

(1)Depression[43] (2)Rage [32] (3)Anxiety[48] (4)Irritable[42]

(5)Other [8] _____
specify

76. HAVE YOU EVER SUFFERED MENTAL ILLNESS OR BREAKDOWN?

(1)Yes [25] (2)No[52] NA [11]

77. IF YES TO #76, DID IT OCCUR (1)Before[2] (2)During[4]

(3)After [20] SERVICE IN VIETNAM? NA [62]

78. WAS THERE ANY CHANGE IN YOUR NORMAL DESIRE FOR SEX? (1)Yes [18]

(2)No [38] (3)Don't know/No answer [18] NA [14]

79. IF YES TO #78, DID THIS OCCUR (1)Before[0] (2)During[2]

(3)After [18] SERVICE IN VIETNAM? NA [68]

80. IF YES TO #78, IS YOUR DESIRE FOR SEX (1)Increased?[9]

(2)Decreased?[13] (3)Completely lost?[2] NA [64]

81. DO YOU HAVE ANY DIFFICULTIES IN MAINTAINING SEXUAL AROUSAL?

(1)Yes [13] (2)No[46] (3)Don't know/No answer[10] NA [19]

82. IF YES TO #81, DID THIS OCCUR (1)Before[1] (2)During[4]

(3)After [13] YOUR SERVICE IN VIETNAM? NA [69]

HERBICIDE EXPOSURE: In this section we are interested in finding what you remember about being exposed to defoliating herbicides, such as Agent Orange, which were used to kill jungle cover, etc. in Vietnam. If you believe you were exposed to

such a chemical agent, either directly by loading it, spraying it, or entering a freshly sprayed area, we would like you to describe how you were exposed and when. Please refer to the attached map marked "B".

NOTE: Agent Orange will be used as a "catch all" name. Other herbicides were used in Vietnam, including Agents White, Blue, Orange II, Purple, Pink and Green. If you know you were exposed to one of these, answer YES to the appropriate question below.

83. WERE YOU DIRECTLY EXPOSED (through inhalation, drinking contaminated water, skin contact, etc.) TO HERBICIDES IN VIETNAM, OR IN TRANSIT TO VIETNAM?

(1)Yes (2)No

If NO, please go onto the next section (Muscle and Bone System, starting with Question 108, page 13).

If YES, please indicate to which herbicide(s) you were exposed:

Agent Orange (1)

Agent Orange II (2)

Agent White (3)

Agent Blue (4)

Agent Purple (5)

Agent Pink (6)

Agent Green (7)

84. WERE YOU A SPRAYER ON A C-123 OR A HELICOPTER? (1)Yes (2)No

If NO, proceed to Question #88.

85. IF YES TO #84, AT WHAT LOCATION WERE YOU IN VIETNAM? [Please refer to the attached sheets designated B, B' and B". Indicate by the appropriate number the place where you spent most of your time, in the space provided]

(1)I Corps_____ (2)II Corps_____

(3)III Corps_____ (4)IV Corps_____

86. FOR HOW LONG WERE YOU EXPOSED? (1)Between 1 and 4 months

(2)Between 5 and 8 months (3)Between 9 and 12 months

(4)Other_____
specify

87. DID YOU EXPERIENCE ANY IMMEDIATE EFFECTS? (1)Yes (2)No

If YES, please specify_____

88. WERE YOU A LOADER/HANDLER OF SPRAY ON EITHER A C-123 OR HELICOPTER?

(1)Yes (2)No

If NO, proceed to Question #92.

89. AT WHAT LOCATION WERE YOU STATIONED IN VIETNAM? [Please refer to the attached sheets designated B, B' and B". Indicate by the appropriate number the place where you spent most of your time, in the space provided]

(1)I Corps_____ (2)II Corps_____

(3)III Corps_____ (4)IV Corps_____

90. FOR HOW LONG WERE YOU EXPOSED? (1)Between 1 and 4 months

(2)Between 5 and 8 months (3)Between 9 and 12 months

(4)Other_____
specify

91. DID YOU EXPERIENCE ANY IMMEDIATE EFFECTS? (1)Yes (2)No

If YES, please specify_____

92. DID YOUR JOB INVOLVE CLEARING VEGETATION AND/OR PATROLLING AROUND CAMP, ROADS, OR CLEARING FREE-FIRE ZONES?

(1)Yes (2)No

If NO, proceed to Question #96.

93. AT WHAT LOCATION WERE YOU STATIONED IN VIETNAM? [Please refer to the attached sheets designated B, B' and B". Indicate by the appropriate number the place where you spent most of your time, in the space provided]

(1)I Corps_____ (2)II Corps_____

(3)III Corps_____ (4)IV Corps_____

94. FOR HOW LONG WERE YOU EXPOSED? (1)Between 1 and 4 months

(2)Between 5 and 8 months (3)Between 9 and 12 months

(4)Other_____
specify

95. DID YOU EXPERIENCE ANY IMMEDIATE EFFECTS? (1)Yes (2)No

If YES, please specify_____

96. DID YOU SLEEP IN OR WALK THROUGH AREAS RECENTLY SPRAYED?

(1)Yes (2)No

If NO, proceed to Question #100.

97. AT WHAT LOCATION WERE YOU STATIONED IN VIETNAM? [Please refer to the attached sheets designated B, B' and B". Indicate by the appropriate number the place where you spent most of your time, in the space provided]

(1)I Corps_____ (2)II Corps_____

(3)III Corps_____ (4)IV Corps_____

98. FOR HOW LONG WERE YOU EXPOSED? (1)Between 1 and 4 months

(2)Between 5 and 8 months (3)Between 9 and 12 months

(4)Other_____
specify

99. DID YOU EXPERIENCE ANY IMMEDIATE EFFECTS? (1)Yes (2)No

If YES, please specify_____

100. DID YOUR JOB INVOLVE HANDLING OF SPRAY DURING STORAGE OR SHIPMENT?

(1)Yes (2)No

If NO, proceed to Question #104.

101. AT WHAT LOCATION IN VIETNAM WERE YOU STATIONED? [Please refer to the attached sheets designated B, B' and B". Indicate by the appropriate number the place where you spent most of your time, in the space provided]

(1)I Corps_____ (2)II Corps_____

(3)III Corps_____ (4)IV Corps_____

102. FOR HOW LONG WERE YOU EXPOSED? (1)Between 1 and 4 months

(2)Between 5 and 8 months (3)Between 9 and 12 months

(4)Other_____
specify

103. DID YOU EXPERIENCE ANY IMMEDIATE EFFECTS? (1)Yes (2)No

If YES, please specify_____

104. WERE YOU POSSIBLY EXPOSED IN OTHER WAYS, SUCH AS, TRANSPORTING HERBICIDES OUTSIDE OF VIETNAM, DRINKING THE WATER, ETC.?

(1)Yes (2)No

If NO, proceed to the top of the next page.

105. AT WHAT LOCATION IN VIETNAM OR ELSEWHERE? [Please refer to the attached sheets designated B, B' and B". Indicate by the appropriate number the place where you spent most of your time, in the space provided]

(1)I Corps_____ (2)II Corps_____

(3)III Corps_____ (4)IV Corps_____

(5)Other_____
specify

106. FOR HOW LONG WERE YOU EXPOSED? (1)Between 1 and 4 months

(2)Between 5 and 8 months (3)Between 9 and 12 months

(4)Other_____
specify

107. DID YOU EXPERIENCE ANY IMMEDIATE EFFECTS? (1)Yes (2)No

If YES, please specify_____

MORE

MUSCLE AND BONE SYSTEM: Please describe if you've experienced unusual tightening, numbness, pain, swelling or stiffness in any of the following joints (not associated with exercise or exertion) during your tour in, or since your return from, Vietnam. Please indicate if you do not have these feelings.

DO YOU EVER EXPERIENCE ANY OF THE FOLLOWING UNUSUAL FEELINGS IN YOUR:

		Tingling	Numbness	Swelling	Stiffness	Pain	None
108.	Hands	(1)	(2)	(3)	(4)	(5)	(6)
109.	Fingers	(1)	(2)	(3)	(4)	(5)	(6)
110.	Wrists	(1)	(2)	(3)	(4)	(5)	(6)
111.	Elbows	(1)	(2)	(3)	(4)	(5)	(6)
112.	Arms	(1)	(2)	(3)	(4)	(5)	(6)
113.	Shoulders	(1)	(2)	(3)	(4)	(5)	(6)
114.	Hips	(1)	(2)	(3)	(4)	(5)	(6)
115.	Knees	(1)	(2)	(3)	(4)	(5)	(6)
116.	Ankles	(1)	(2)	(3)	(4)	(5)	(6)
117.	Feet	(1)	(2)	(3)	(4)	(5)	(6)
118.	Toes	(1)	(2)	(3)	(4)	(5)	(6)
119.	Neck	(1)	(2)	(3)	(4)	(5)	(6)

120. WHAT WAS YOUR JOB (MOS- military occupation specialty)? _____

_____
please specify

121. TO WHICH UNIT(S) WERE YOU ASSIGNED IN VIETNAM (include corps, battalion, company, platoon, wing, if possible)?

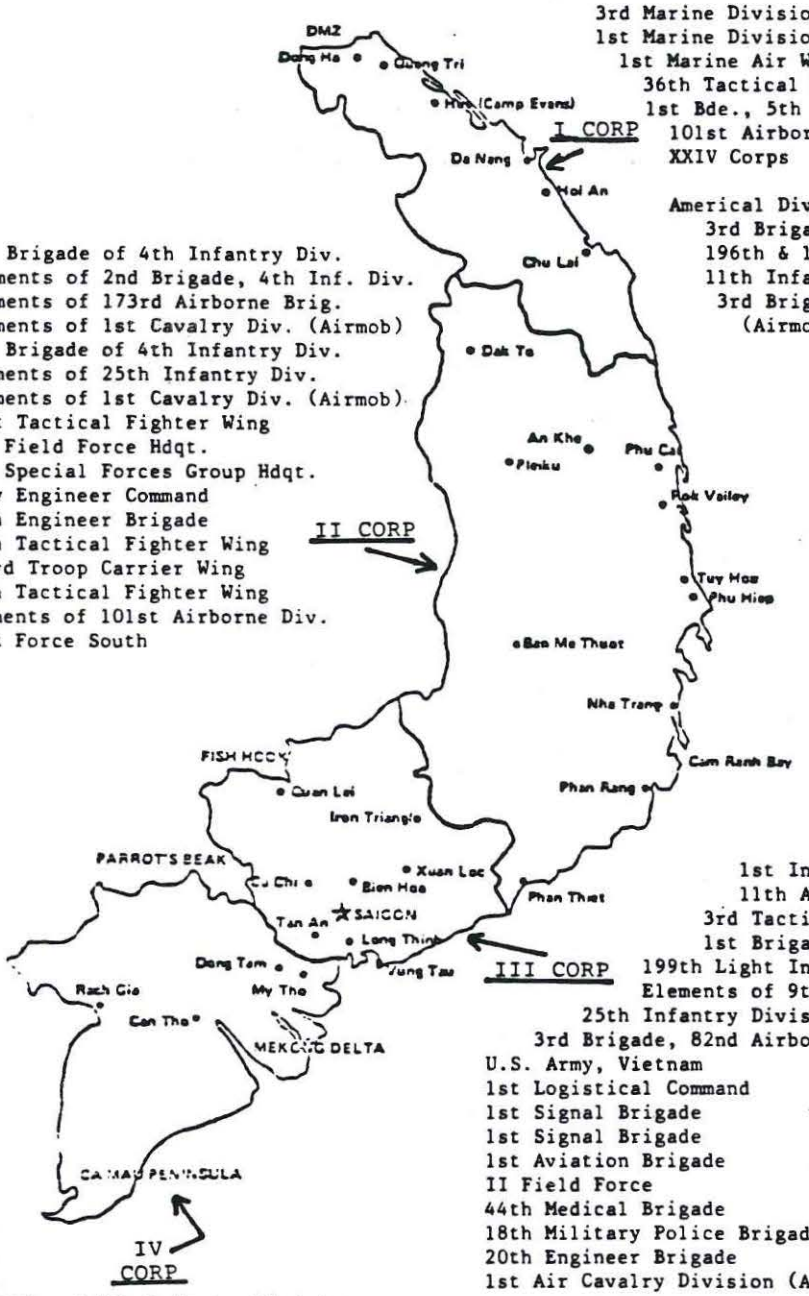
_____

_____

LIST A

Use the substances placed on this list as a reference for answering questions dealing with substance exposure.

atomic (ionizing) radiation
ammonia
acids
alkalis or caustics
asbestos
benzene
beryllium
cadmium
ceramic dust
chemical dusts
chlorine
chromium
cleaning fluids (solvents)
coal dust
coal tar
cobalt
cotton dust
degreasing solvents
dusty work atmosphere
dyes
exhaust fumes
fibrous glass/rock wool
flourides
heat (extreme)
herbicide chemicals
insulation materials
irritating gasses
irritating fumes or mists
lead
machine oil/cutting oil
mercury
metal dusts
metal fumes
mineral dusts (diatomacious earth, vermiculite, perlite molecular sieve or filter
mineral spirits
mining
nickel
noise (loud)
paints
pesticide chemicals
petroleum distillate
PCBs (polychlorinated biphenyls)
phenol
plastics/resins
radioactive materials
silica or quartz
solvents or cleaning fluids
sugar cane
transformer fluid/capacitor fluids
uranium
vanadium
vinyl chloride
welding fumes
x-rays



3rd Marine Division
1st Marine Division
1st Marine Air Wing
36th Tactical Fighter Wing
1st Bde., 5th Infantry Division
101st Airborne Division
XXIV Corps

Americal Division:
3rd Brigade of 4th Infantry Div.
196th & 198th Light Infantry Bdes
11th Infantry Brigade
3rd Brigade of 1st Cavalry Div.
(Airmobile) also attached

1st Brigade of 4th Infantry Div.
Elements of 2nd Brigade, 4th Inf. Div.
Elements of 173rd Airborne Brig.
Elements of 1st Cavalry Div. (Airmob)
2nd Brigade of 4th Infantry Div.
Elements of 25th Infantry Div.
Elements of 1st Cavalry Div. (Airmob)
31st Tactical Fighter Wing
1st Field Force Hdqt.
5th Special Forces Group Hdqt.
Army Engineer Command
18th Engineer Brigade
12th Tactical Fighter Wing
483rd Troop Carrier Wing
35th Tactical Fighter Wing
Elements of 101st Airborne Div.
Task Force South

1st Infantry Division
11th Armored Cavalry Regiment
3rd Tactical Fighter Wing
1st Brigade of 101st Airborne Div
199th Light Infantry Brigade
Elements of 9th Infantry Brigade
25th Infantry Division
3rd Brigade, 82nd Airborne Division
U.S. Army, Vietnam
1st Logistical Command
1st Signal Brigade
1st Signal Brigade
1st Aviation Brigade
II Field Force
44th Medical Brigade
18th Military Police Brigade
20th Engineer Brigade
1st Air Cavalry Division (Airmobile)

Elements of 9th Infantry Division
Delta Helicopter Aviation Battalion
Headquarters for Navy River Patrol Boats,
Seal Teams, Junk Forces; Army Special Forces

LIST B'

Please use these lists to identify where you were located in Vietnam. Place the identifing number of the village or base in the space provided in the questions on pages 10, 11, 12 and 13.

I CORP

Place	Identifing number	Place	Identifing number
Dong Ha	001	Hue	011
Hamburger Hill	002	Hoi An	012
Camp Carroll	003	Phu Bai	013
Ashau Valley	004	Camp Eagle	014
Khe Sanh	005	Tam Key	015
Da Nang	006	Tra Bong	016
Chu Lai	007	Duc Pho	017
Quong Ngai	008	Phu Loc	018
Kham Duc	009	FSB Tomahawk	019
Quong Tri	010	Other	020

_____
specify

_____
specify

II CORP

Place	Identifing number	Place	Identifing number
Dak Pek	021	Dalat	043
Dak To	022	Phan Thiet	044
Ben Het	023	Song Mao	045
Plei Kleng	024	Phan Rang	046
Fire Base November	025	Cam Rahn Bay	047
Kontum	026	Dong Ba Thin	048
Pleiku	027	Nha Trang	049
Camp Holloway	028	Kanh Duong	050
Camp Enari	029	Duc Mai	051
LZ x-ray	030	Phu Hiep	052
Oasis	031	Tuy Hoa	053
Ban Blech	032	Dong Tre	054
Ban Me Thuot	033	Phu Tuc	055
Duc Lap	034	Che Reo	056
Qui Nhon	035	Van Canh	057
Phu Cat	036	Rok Valley	058
Hammond	037	Fire Base Copperhead	059
Bon Son	038	Dau Tang	060
An Loa Valley	039	Cu Chi	061
LZ English	040	An Khe	062
Nhon Co	041	Ho Bo Woods	063
Bao Loc	042	Other	064

_____
specify

_____
specify

LIST B"

Please use these lists to identify where you were located in Vietnam. Place the identifying number of the village or base in the space provided in the questions on pages 10, 11, 12 and 13.

III CORP

Place	Identifying number
Duc Phong	065
Song Be	066
Bu Dop	067
Fish Hook	068
Loc Ninh	069
Black Virgin Mountain	070
Tay Ninh	071
Parrot's Beak	072
Lai Khe	073
Phu Loi	074
Bien Hoa	075
Saigon	076
Long Thinh	077
Vung Tau	078
Cu Chi	079

Place	Identifying number
Bear Cat	080
Long Binh	081
Long Giao	082
Ham Tam	083
Iron Triangle	084
Swan Loc	085
Phu Vinh	086
Ton Son Nhut	087
Dau Tieng	088
French Fort	089
Katum	090
Quan Lei	091
Xuan Loc	092
Other	093

specify _____

specify _____

IV CORP

Place	Identifying number
Moc Hoa	094
An Lon	095
Rach Gia	096
U Minh Forest	097
Cau Mau	098
Soc Trang	099
Tan An	100

Place	Identifying number
Can Tho	101
Mekong Delta	102
Vinh Long	103
Dong Tam	104
My Tho	105
Other	106

specify _____

specify _____

NOTE: THIS SHEET WILL BE SEPARATED FROM THE REST OF THE QUESTIONNAIRE UPON RECEIPT.

_____
number on questionnaire

We hope to make this study an on-going project and we request your future cooperation in this effort. If you are interested in having us get in touch with you in the near future, please supply the information requested below.

ARE YOU INTERESTED IN PARTICIPATING IN FUTURE STUDIES?

Circle: Yes or No

If YES, please fill in below:

_____
Your name BIRTHDATE

_____
Your address

_____
City State Zip Code

( )_____
Phone (please include area code)

_____
Your PERMANENT address (If available, this would be an address where we could always mail you further information)

_____
City State Zip Code

( )_____
Phone at PERMANENT address, if available (please include area code)

* * *

PLEASE NOTE: Any comments you wish to make on the questionnaire or about what happened to you in Southeast Asia would be appreciated. Please use as much space as you need! Extra paper is available.

APPENDIX C

CONSENT AGREEMENT

Your participation in this study is completely voluntary and you may refuse to answer any questions or stop participating in the study at any time, without suffering any penalty or prejudice.

Participation of those taking this questionnaire will help better understand potential risks associated with exposure to herbicides in Vietnam.

Information is being collected only for this study. All information collected from you will be kept confidential. No information that identifies any individual will be released, and the results of the study may be published only as statistical summaries.

Any questions about this study may be addressed to those administering the questionnaire.

Thank you

Dave Weller

- - - - - - - - - - - - -

I hereby certify that I understand the information presented above (and in the introduction on the attached questionnaire) and agree to participate.

Signature:_____ Date:_____

Witnessed:_____

- - - - - - - - - - - - -

ADDITIONAL INFORMATION

IF ANY QUESTIONS ON THIS SURVEY CAUSE YOU DISTRESS, the following phone numbers are supplied for your convenience:

San Jose Veterans Outreach Center
(psychological counseling)
(408) 249-1643

Veterans Administration Agent Orange Program
(medical assistance; in Palo Alto)
(415) 493-5000, ext. 5895

Robert Dickover, Research Unit, CA. Dept. of Corrections
(916) 323-4072

APPENDIX D

SJSU SAN JOSE STATE UNIVERSITY

A campus of The California State University

School of Science • Department of Biological Sciences
One Washington Square • San Jose, California 95192-0100 • 408/277-2355

November 11, 1985

To: Human subjects guidelines committee

From: Dave Weller
graduate student, Biology/Environmental Studies

About: attached questionnaires on Agent Orange exposure

I was first alerted to the possible need for institutional approval from San Jose State University during a meeting with Robert Dickover at the California Department of Corrections. I was seeking approval from the department to administer 20 or 30 questionnaires to Vietnam veterans incarcerated at Soledad. I thought this might be an important sub-population of veterans to test because dioxin is known to have neurological effects, and I wanted to see if those in prison had more or different symptoms involving dioxin (or the combination of materials veterans may have been exposed to). Mr. Dickover asked if I had approval from S.J.S.U.'s human subjects committee and I had to say I didn't think I had to, since it was a questionnaire and didn't involve any experimentation. I also believed the attached consent agreement might cover my study satisfactorily. Mr. Dickover suggested I look into the matter in more depth.

I intend to use basically two populations (and sub-populations), as follows:

Vietnam veterans (control- Vietnam-era veterans)

native Vietnamese (control- Vietnamese living in large, urban areas)

I have already distributed most copies of my veterans questionnaires to the Veterans Outreach Centers of San Jose and Concord. I have worked with them, building confidence, for more than 1 year. I have their cooperation in this effort.

I have just received the Vietnamese translation on the questionnaire and am having it "fine tuned" at this moment. I expect to have the cooperation of elements of the local Vietnamese community. I have been spending time for the last few months building confidence and contacts within this community.

My thesis advisor, Dr. Henry Robinson, has agreed that my thesis may consist of a preliminary run of my questionnaire to work out any "bugs", with written thesis and seminar, of course. I am attempting to make it more meaningful than just a dry run, because of all the effort I've put into my thesis to this point.

I hope approval might be expedited (since I'm already administering the study) and, of course, would be willing to meet with anyone necessary to clear up any questions.

Dr. Henry Robinson, Professor
Department of Biological Sciences

Dave Weller, Grad. Student
Special Major Masters in
Environmental Biology

APPENDIX E

VÀI ĐIỂM GHI CHÚ

Hóa chất màu cam được dùng, trong bài nghiên cứu này, là tên của một loại thuốc diệt cỏ trong thời gian tiến hành chương trình phun thuốc từ khoảng 1964 đến 1970. Hóa chất màu cam và các loại thuốc diệt cỏ khác được sử dụng tại miền Nam Việt Nam là để khai quang cây cối, làm cho chúng mất tác dụng che trở, và để phá hủy mùa màng.

Hóa chất màu cam phần lớn được phun bằng máy bay cho những vùng rộng lớn. Ngoài ra trực thăng và máy bơm tay cũng được sử dụng. Bởi vậy, biết được bạn ở đâu tại miền Nam Việt Nam và hồi nào là rất quan trọng — sự tiếp xúc hóa chất của bạn sẽ thay đổi tùy theo những yếu tố này.

Vấn đề ảnh hưởng sức khỏe của hóa chất màu cam liên quan đến việc sử dụng hóa chất này trong cuộc chiến tranh Đông Dương thứ hai đã được đặt ra từ năm 1970. Bản nghiên cứu này cốt để so sánh những người có thể đã tiếp xúc với hóa chất và những người chưa tiếp xúc, để xem hậu quả sau khi tiếp xúc thế nào (nếu có).

Xin lưu ý:

* Bản nghiên cứu này hoàn toàn không liên quan đến bất cứ một chính phủ nào. Sự tham gia của bạn sẽ không được bất cứ sự bồi thường nào do bất cứ một chính phủ nào vì hậu quả sức khỏe bất lợi.
* Những câu trả lời của bạn sẽ được giữ kín! Không một ai sẽ bị nhận ra bởi tên bằng bất cứ cách nào. Bản câu hỏi do bạn điền đầy đủ sẽ được giữ kín.

SỰ ĐỒNG Ý

Bạn tham gia cuộc nghiên cứu này là hoàn toàn tình nguyện và bạn có thể từ chối trả lời bất cứ câu hỏi nào hoặc là thôi tham gia bất cứ lúc nào.

Sự tham gia trả lời những câu hỏi này sẽ giúp hiểu rõ hơn về khả năng nguy hiểm tiếp xúc thuốc diệt cỏ tại Việt Nam.

Tài liệu chỉ thu lượm cho bản nghiên cứu này mà thôi. Mọi chi tiết của bạn đều được giữ kín. Không một chi tiết nào liên quan đến bất cứ một ai sẽ được tiết lộ. và kết quả của cuộc nghiên cứu này có thể chỉ được coi như thống kê tổng kết mà thôi.

+ + + + + + +

Tôi chứng nhận đã hiểu lời nói trên đây (và trong phần mở đầu kèm theo bản câu hỏi này) và đồng ý tham gia.

Ký tên: _____ Ngày: _____

BẢN CÂU HỎI

Ngày _____ Số _____

Mục đích bản nghiên cứu này là để thực hiện một cuộc phân tích về yếu tố nguy hại để định đoạt xem sự vô tình tiếp xúc voi chat hóa học (đặc biệt là thuốc diệt cỏ) có làm cho người ta đau khổ vì bệnh tật gia tăng bởi sự tiếp xúc đó không. Những câu hỏi cũng nhằm phát hiện xem những con nít của cựu quân nhân trong cuộc chiến tranh Việt Nam, hoặc những người dân bản xứ Việt Nam, vừa được đi trú qua, có nguy hiểm gia tăng về sự bất bình thường từ khi sơ sanh không.

Cuộc nghiên cứu kỹ lưỡng này do Anh Dave Weller, tốt nghiệp Đại Học San Jose State University phụ trách, với sự hướng dẫn của một số giáo sư của Anh.

Xin ghi câu trả lời của bạn trên bản câu hỏi này. Bôi đậm con số phù hợp với câu trả lời của bạn (xem ví dụ dưới đây). Khi cần có thêm một câu trả lời nữa, xin dùng khoảng trống trên bản câu hỏi này. Có một số câu hỏi cần phải có trên một câu trả lời.

Xin chú ý là những phụ chương kèm đây để giúp bạn trả lời một số câu hỏi.

VI DỤ:

Hôm nay bạn có vui không? (1) Có (2) Không
Nếu hôm nay bạn vui, bạn sẽ bôi đậm số (1). Nếu hôm nay bạn không vui thì bạn sẽ bôi đậm số (2) trên bản câu hỏi này.

Có một số câu hỏi dường như không liên quan gì, hoặc có tính cách rất cá nhân, nhưng câu trả lời chân thực cho mỗi câu hỏi của bạn, có thể giúp khám phá vấn đề tiếp xúc với chất hóa học o Viet Nam.

* * *

CÂU TRẢ LỜI TRUNG THỰC CỦA BẠN SẼ ĐƯỢC GIỮ KÍN!

XIN THÀNH THỰC CẢM ƠN SỰ HỢP TÁC CỦA BẠN!

* * *

1. NAM HAY NỮ: (1) Nam [25] (2) Nữ [6]
2. TUỔI: NA=[11] (1) 25 đến 29 [5] (2) 30 đến 34 [6]
   (3) 35 đến 39[2] (4) 40 đến 44 [3] (5) 45 và trở lên[6]

3. GỐC DÂN TỘC: (1) Việt Nam [26] (2) Trung Hoa [7]
(3) Dân tộc khác _____ (Xin ghi rõ)

4. NGHỀ NGHIỆP HIỆN NAY CỦA BẠN? NA=[4] (1) Buôn bán [0]
(2) Làm nhà hàng [0] (3) Làm việc kỹ thuật [0]
(4) Làm công việc yểm trợ [0] (5) Làm việc khác [29] _____ (xin ghi rõ)

_____
(Thí dụ: chuyên nghiệp, học sinh, thất nghiệp, v.v.)

5. BẠN CÓ ĐI LÍNH CHƯA? (1) Có [11] (2) Chưa [18] NA=[4]

6. NẾU BẠN TRẢ LỜI CÓ CHO CÂU HỎI SỐ 5, VẬY BẠN PHỤC VỤ NGHÀNH NÀO?
(1) Lục Quân Việt Nam Cộng Hòa [5] (2) Không Quân [1]
(3) Dân sự (như Hội Hồng Thập Tự, Cơ quan AID, v.v.) [1]
(4) Dân sự trong quân đội [1] (5) Các ngành khác [6] _____ (Xin ghi rõ)
NA= [19]

7. BẠN CÓ Ở VIỆT NAM XUỐT TRONG THỜI CHIẾN KHÔNG? [29] (1) Có (2) Không [2]
NA=[2]

8. NẾU BẠN TRẢ LỜI KHÔNG CHO CÂU HỎI SỐ 7, XIN CHO BIẾT BẠN KHÔNG Ở VIỆT NAM TRONG THỜI KỲ NÀO (Lâu quá 3 tháng)?
(1) Thời kỳ thứ nhất, từ ____ (tháng) ____ (năm) đến ____ (tháng) ____ (năm)
(2) Thời kỳ thứ nhì, từ ____ (tháng) ____ (năm) đến ____ (tháng) ____ (năm)

9. BẠN CÓ PHỤC VỤ NGOÀI VIỆT NAM TRÊN 6 THÁNG KHÔNG?
(1) Có (2) Không (3) Không thích hợp/không trả lời
NẾU CÓ, BẠN PHỤC VỤ TẠI ĐÂU LÂU NHẤT? _____ (Địa điểm)
Từ ____ (tháng) ____ (năm) đến ____ (tháng) ____ (năm)

10. NẾU TRẢ LỜI CÓ CHO CÂU HỎI SỐ 9, VẬY THEO BẠN ĐƯỢC BIẾT, CHẤT HÓA HỌC NÔNG NGHIỆP (như thuốc diệt cỏ) CÓ ĐƯỢC SỬ DỤNG TRONG VÙNG ẤY KHÔNG? (1) Có (2) Không (3) Không rõ
NẾU CÓ, BẠN CÓ BIẾT LOẠI CHẤT HÓA HỌC NÔNG NGHIỆP NÀO ĐÃ ĐƯỢC SỬ DỤNG, VÀ TRONG THỜI GIAN BAO LÂU?

_____
Chất hóa học được sử dụng — Thời gian được sử dụng

TRONG KHI Ở VIỆT NAM, BẠN CÓ BAO GIỜ ĐI KHÁM BỆNH VÌ SỰ PHÁT VIÊM NHỮNG CHỨNG BỆNH SAU ĐÂY KHÔNG? VÀ BẠN CÓ ĐƯỢC ĐIỀU TRỊ KHÔNG? (Xin chú ý: Những câu hỏi này có thể cần 2 câu trả lời).

		KHÁM BỆNH CÓ	KHÁM BỆNH KHÔNG	ĐIỀU TRỊ CÓ	ĐIỀU TRỊ KHÔNG
11.	Sán lãi trong ruột	(1)	(2)	(3)	(4)
12.	Bệnh lao	(1)	(2)	(3)	(4)
13.	Bệnh gan (Serum Hepatitis)	(1)	(2)	(3)	(4)
14.	Bệnh sưng gan	(1)	(2)	(3)	(4)
15.	Bệnh trùng a-míp hoặc đi lỵ (Amebic or bacterial dysentery)	(1)	(2)	(3)	(4)
16.	Bệnh giang mai	(1)	(2)	(3)	(4)
17.	Bệnh sốt rét rừng (Malaria)	(1)	(2)	(3)	(4)
18.	NẾU BẠN TRỊ BỆNH SỐT RÉT RỪNG, CÓ DÙNG THUỐC DAPSONE KHÔNG? (1) Có (2) Không (3) Không rõ				
19.	Bệnh tật khác _____ (Xin ghi rõ)	(1)	(2)	(3)	(4)
20.	Bệnh tật khác _____ (Xin ghi rõ)	(1)	(2)	(3)	(4)

HOÀN CẢNH NƠI LÀM VIỆC: TỪ KHI RỜI VIỆT NAM, THEO BẠN ĐƯỢC BIẾT, BẠN CÓ THƯỜNG XUYÊN TIẾP VỚI:

21. Chất hóa học không? (1) Có (2) Không (3) Không rõ
22. Chất phóng xạ không? (1) Có (2) Không (3) Không rõ

NẾU BẠN TRẢ LỜI KHÔNG CHO CÂU HỎI SỐ 21 VÀ 22, XIN TIẾP TỤC TRẢ LỜI CÂU HỎI SỐ 27.

NẾU BẠN TRẢ LỜI CÓ CHO 1 HAY CẢ 2 CÂU HỎI TRÊN, XIN TRẢ LỜI CÂU HỎI SỐ 23 ĐẾN 26.

23. TRONG NĂM QUA, BẠN CÓ TIẾP XÚC VỚI CHẤT HÓA HỌC TẠI MỘT NƠI LÀM VIỆC KHÔNG? (1) Có (2) Không (3) Không rõ
24. TỪ 2 ĐẾN 10 NĂM QUA, BẠN CÓ TIẾP XÚC CHẤT HÓA HỌC TẠI MỘT NƠI LÀM VIỆC KHÔNG? (1) Có (2) Không (3) Không rõ
25. TRONG NĂM QUA, BẠN CÓ TIẾP XÚC CHẤT PHÓNG XẠ (ngoại trừ chiếu điện răng và phổi) TẠI MỘT NƠI LÀM VIỆC KHÔNG?
(1) Có (2) Không (3) Không rõ

26. TỪ 2 ĐẾN 10 NĂM QUA, BẠN CÓ TIẾP XÚC CHẤT PHÓNG XẠ (ngoại trừ chiếu điện răng và phổi) TẠI MỘT NƠI LÀM VIỆC KHÔNG?
(1) Có (2) Không (3) Không rõ
NẾU CÓ THÌ CHẤT ĐÓ DO ĐÂU ĐẾN VÀ TIẾP XÚC BAO LÂU?

TIẾP XÚC CÁC CHẤT KHÁC:

27. TRONG 10 NĂM QUA, BẠN CÓ TIẾP XÚC CHẤT HÓA HỌC ĐANG LÚC LÀM ĐIỀU SỞ THÍCH CỦA MÌNH, HAY LÀ ĐANG LÚC CÓ NHỮNG HOẠT ĐỘNG KHÁC Ở NHÀ, HOẶC Ở NƠI NGOÀI CHỖ LÀM VIỆC (Xin tham chiếu danh sách A kèm dây)? (1) Có (2) Không (3) Không rõ
NẾU TRẢ LỜI CÓ CHO CÂU HỎI SỐ 27, XIN LIỆT KÊ 3 TRƯỜNG HỢP TIẾP XÚC CHẤT HÓA HỌC THÔNG THƯỜNG NHẤT TẠI NƠI NGOÀI CHỖ LÀM VIỆC TRONG 10 NĂM QUA.

Chất hóa học	Thời gian bị tiếp xúc	Bao lâu tiếp xúc một lần
Chất hóa học	Thời gian bị tiếp xúc	Bao lâu tiếp xúc một lần
Chất hóa học	Thời gian bị tiếp xúc	Bao lâu tiếp xúc một lần

THÓI QUEN CÁ NHÂN:

28. BẠN CÓ HỀ BAO GIỜ DÙNG SẢN PHẨM THUỐC LÁ KHÔNG?
(1) Có (2) Không
29. NẾU BẠN TRẢ LỜI CÓ CHO CÂU HỎI SỐ 28, VẬY SẢN PHẨM THUỐC LÁ LOẠI NÀO? (1) Thuốc hút (2) Xì gà (3) Thuốc hút píp
(4) Thuốc nhai (5) Tất cả các loại trên (6) Loại khác
30. BẠN HIỆN NAY CÓ ĐANG DÙNG SẢN PHẨM THUỐC LÁ KHÔNG?
(1) Có (2) Không
NẾU CÓ, BẠN DÙNG NHỮNG SẢN PHẨM NÀY ĐƯỢC BAO LÂU? _____
31. NẾU BẠN TRẢ LỜI CÓ CHO CÂU HỎI SỐ 30, SỐ LƯỢNG BAO NHIÊU?
(1) Mỗi ngày dưới 1 bao (2) Mỗi ngày từ 2 đến 4 bao
(3) Mỗi ngày trên 4 bao (4) Mỗi ngày từ 1 đen 3 túi
(5) Mỗi ngày 1 điếu xì gà hay là dây 1 cái píp
(6) Mỗi ngày trên 1 điếu xì gà hoặc trên 1 cái píp
32. BẠN CÓ UỐNG BIA KHÔNG? (1) Có (2) Không
33. NẾU BẠN TRẢ LỜI CÓ CHO CÂU HỎI SỐ 32, BẠN UỐNG BAO NHIÊU BIA?
(1) Mỗi ngày uống dưới 6 lon/chai
(2) Mỗi ngày uống từ 6 đến 12 lon/chai
(3) Mỗi ngày uống trên 12 lon/chai
34. BẠN CÓ UỐNG RƯỢU MẠNH KHÔNG? (1) Có (2) Không
35. NẾU BẠN TRẢ LỜI CÓ CHO CÂU HỎI SỐ 34, BẠN UỐNG BAO NHIÊU?
(1) Mỗi ngày dưới 2 ly (2) Mỗi ngày từ 2 đến 5 ly
(3) Mỗi ngày trên 5 ly

36. BẠN CÓ UỐNG RƯỢU VANG KHÔNG? (1) Có (2) Không
37. NẾU BẠN TRẢ LỜI CÓ CHO CÂU HỎI SỐ 36, MỖI NGÀY UỐNG MẤY LY?
(1) Dưới 2 ly (2) Từ 2 đến 5 ly (3) Trên 5 ly

KỸ LỤC DI TRUYỀN:

38. BẠN HAY GIA ĐÌNH BẠN CÓ BỊ ẢNH HƯỞNG BỞI CHỨNG QUÁI THAI, HAY BỆNH DI TRUYỀN NÀO ĐÃ ĐƯỢC PHÁT HIỆN KHÔNG?
(1) Có (2) Không

NẾU CÓ. XIN GHI RÕ _____

39. GIA ĐÌNH HAY BẤT CỨ NGƯỜI NÀO MÀ BẠN CÓ CON VỚI HỌ CÓ BỊ ẢNH HƯỞNG BỞI CHỨNG QUÁI THAI, HAY BỆNH DI TRUYỀN NÀO ĐÃ ĐƯỢC PHÁT HIỆN KHÔNG? (1) Có (2) Không (3) Không rõ
NẾU CÓ, XIN GHI RÕ _____

40. BẠN VÀ VỢ HAY CHỒNG BẠN CÓ GẶP KHÓ KHĂN TRONG VIỆC THỤ THAI (đã cố gắng 1 năm trời mà không thành công) HOẶC ĐƯỢC PHÁT HIỆN LÀ KHÔNG SANH DỤC ĐƯỢC? (1) Có (2) Không
NẾU CÓ, XIN GHI RÕ _____

41. TRƯỚC KHI (vào khoảng 1965) HOA KỲ THAM CHIẾN Ở VIỆT NAM, BẠN CÓ CON CÁI CHƯA? (1) Có (2) Chưa
42. NẾU BẠN TRẢ LỜI CÓ CHO CÂU HỎI SỐ 41, VẬY CON CÁI BẠN CÓ KHỎE MẠNH VỀ THỂ XÁC CŨNG NHƯ VỀ TINH THẦN KHÔNG?
(1) Có (2) Không
NẾU KHÔNG, XIN GHI RÕ _____

43. SAU KHI (vào khoảng 1975) HOA KỲ THAM CHIẾN Ở VIỆT NAM, BẠN CÓ CON CÁI KHÔNG? (1) Có (2) Không
44. NẾU BẠN TRẢ LỜI CÓ CHO CÂU HỎI SỐ 43, CON CÁI BẠN CÓ KHỎE MẠNH VỀ THỂ XÁC CŨNG NHƯ VỀ TINH THẦN KHÔNG? (1) Có (2) Không
NẾU KHÔNG, XIN GHI RÕ _____

KỸ LỤC SỨC KHỎE:

45. KHI CÒN NHỎ, BẠN CÓ MỌC MỤN KHÔNG? (1) Có (2) Không
46. CÓ KHỎI BỆNH KHÔNG? (1) Có (2) Không
47. KHI LỚN LÊN, BẠN CÓ MỌC MỤN KHÔNG? (1) Có (2) Không
48. TRONG KHI HOA KỲ THAM CHIẾN Ở VIỆT NAM, BẠN CÓ MỌC NHỮNG NÚT NHỎ MỤN KHÔNG? (1) Có (2) Không (3) Không rõ/Không trả lời
49. SAU KHI HOA KỲ THAM CHIẾN Ở VIỆT NAM, BẠN CÓ MỌC NHỮNG NÚT NHỎ MỤN KHÔNG? (1) Có (2) Không (3) Không rõ/Không trả lời

50. NẾU BẠN TRẢ LỜI CÓ CHO CÂU HỎI SỐ 48 HAY 49, VẬY MỤN MỌC Ở ĐÂU? (Xin chú ý: Có thể cần trên 1 câu trả lời).
(1) Dưới mắt bạn (2) Trên cánh tay bạn (3) Trên mình bạn
(4) Trên cổ bạn (5) Sau tai bạn (6) Ở chân bạn
(7) Ở dùi bạn

51. BẠN CÓ HỀ BAO GIỜ THAY ĐỔI MÀU SẮC DA KHÔNG? (Không phải vì phơi nắng) (1) Có (2) Không (3) Không rõ

52. NẾU BẠN TRẢ LỜI CÓ CHO CÂU HỎI SỐ 51, DA BẠN CÓ:
(1) Trắng hơn (2) Đen hơn

53. VIỆC NÀY XẢY RA (1) Trước khi (2) Trong khi
(3) Sau khi HOA KỲ THAM CHIẾN Ở VIỆT NAM?

54. MẮT BẠN CÓ NHẠY CẢM VỚI ÁNH SÁNG HƠN LÚC THƯỜNG KHÔNG?
(1) Có (2) Không (3) Không rõ

55. VIỆC NÀY XẢY RA (1) Trước khi (2) Trong khi (3) Sau khi HOA KỲ THAM CHIẾN Ở VIỆT NAM.

56. CÒN BỘ PHẬN NÀO TRÊN THÂN THỂ BẠN GIA TĂNG SỰ NHẠY CẢM VỚI ÁNH SÁNG KHÔNG? (1) Có (2) Không (3) Không nhớ rõ

57. NẾU BẠN TRẢ LỜI CÓ CHO CÂU HỎI SỐ 56, BẠN CÓ BỊ NHỮNG BỆNH SAU ĐÂY KHÔNG? (1) Mụn ghẻ nước (2) Đầu (3) Phát ban nặng
(4) Cac bệnh khác _____

58. BẠN CÓ HỀ NHẬN THẤY SỰ THAY ĐỔI MÀU SẮC VÀ KIỂU HÌNH (ngoại trừ sự hói đầu bình thường) CỦA MÁI TÓC BẠN KHÔNG?
(1) Có (2) Không (3) Không nhớ rõ

59. NẾU BẠN TRẢ LỜI CÓ CHO CÂU HỎI SỐ 58, BẠN NHẬN THẤY THẾ NÀO? (Chú ý: có thể cần trên 1 câu trả lời).
(1) Nhiều tóc hơn (2) Ít tóc hơn (3) Mầu tóc nhợt hơn
(4) Mầu tóc đậm hơn

60. VIỆC NÀY XẢY RA (1) Trước khi (2) Trong khi (3) Sau khi HOA KỲ THAM CHIẾN.

BÁC SĨ CÓ HỀ BAO GIỜ BẢO BẠN LÀ BẠN CÓ BỆNH SAU ĐÂY. XIN GHI RÕ NĂM BỆNH MỚI PHÁT.

		CÓ	KHÔNG	NĂM PHÁT HIỆN BỆNH
61.	Xốt (Hay fever)	(1)	(2)	_____
62.	Bệnh phản ứng (Allergies)	(1)	(2)	_____
63.	Máu cao	(1)	(2)	_____
64.	Bệnh tim	(1)	(2)	_____
65.	Bệnh trúng phong	(1)	(2)	_____
66.	Bệnh thận	(1)	(2)	_____
67.	Bệnh thiếu máu	(1)	(2)	_____
68.	Bệnh gan	(1)	(2)	_____
	Xin ghi rõ			_____
69.	Bệnh nhẻ, bướu mỡ hay tiểu nang (Benign, fatty tumors or cysts)	(1)	(2)	_____
	Xin ghi rõ			_____
70.	Các bướu khác hay căng xe (Other tumors or cancer)	(1)	(2)	_____
	Xin ghi rõ			_____

SỨC KHỎE TỔNG QUÁT:

71. BẠN CÓ NGỦ NGON KHÔNG? (1) Có (2) Không
72. SAU KHI RỜI VIỆT NAM, BẠN CÓ KHÔNG THAY ĐỔI CHẾ ĐỘ ĂN UỐNG MÀ XÚT GIẢM 20 HAY TRÊN 20 POUNDS KHÔNG? (1) Có (2) Không
73. BẠN CÓ BAO GIỜ KHÔNG NGON MIỆNG KHÔNG? (1) Có (2) Không
74. BẠN HAY GIA ĐÌNH BẠN CÓ NHẬN THẤY CÁ TÁNH BẠN THAY ĐỔI KHÔNG? (1) Có (2) Không
75. BẠN CÓ THƯỜNG XUYÊN (không phải thỉnh thoảng) CÓ TRIỆU CHỨNG NHỨNG SỰ KIỆN SAU ĐÂY KHÔNG (Chú ý: Có thể cần trên 1 câu trả lời)?
    (1) Xuống tinh thần (2) Giận dữ (3) Lo lắng
    (4) Dễ bị cảm xúc (5) Các sự kiện khác _____
    Xin ghi rõ
76. BẠN CÓ HỀ BAO GIỜ BỊ BỆNH THẦN KINH HAY ỐM ĐAU NẶNG (Breakdown) KHÔNG? (1) Có (2) Không
77. NẾU BẠN TRẢ LỜI <u>CÓ</u> CHO CÂU HỎI SỐ 76, VẬY BỆNH PHÁT RA
    (1) Trước khi (2) Trong khi (3) Sau khi HOA KỲ THAM CHIẾN.

78. BẠN CÓ GÌ THAY ĐỔI VỀ TÌNH DỤC KHÔNG?
(1) Có (2) Không (3) Không rõ/Không trả lời

79. NẾU BẠN TRẢ LỜI CÓ CHO CÂU HỎI SỐ 78, VẬY VIỆC NÀY XẢY RA
(1) Trước khi (2) Trong khi (3) Sau khi HOA KỲ THAM CHIẾN

80. NẾU BẠN TRẢ LỜI CÓ CHO CÂU HỎI SỐ 78, VẬY TÌNH DỤC BẠN
(1) Gia tăng (2) Giảm thiểu (3) Hoàn toàn mất hết

81. BẠN CÓ KHÓ KHĂN TRONG VIỆC KHÊU GỢI TÌNH DỤC KHÔNG?
(1) Có (2) Không (3) Không rõ/ Không trả lời

82. NẾU BẠN TRẢ LỜI CÓ CHO CÂU HỎI SỐ 81, VẬY VIỆC NÀY XẢY RA
(1) Trước khi (2) Trong khi (3) Sau khi HOA KỲ THAM CHIẾN

TIẾP XÚC THUỐC DIỆT CỎ: Trong phần này chúng tôi chú trọng đến gì bạn nhớ được khi tiếp xúc thuốc diệt cỏ khai quang như hóa chất màu cam dùng để phá hủy sự um tùm trong rừng, v.v. tại Việt Nam. Nếu bạn cho rằng mình có trực tiếp tiếp xúc chất hóa này do việc sử dụng chất đó (bốc hàng, phun thuốc v.v.) hay có vào qua vùng mới được phun chất này. Chúng tôi muốn bạn mô tả bạn tiếp xúc như thế nào và hồi nào. Xin tham chiếu bản đồ có ghi chữ "B" kèm dây.
Chú ý: Hóa chất màu cam sẽ được kêu bằng tên "catch all" (Bắt tất cả). Những thuốc diệt cỏ khác được sử dụng tại Việt Nam gồm có hóa chất màu trắng, màu xanh trời, màu cam II, màu tím, màu hường và màu xanh lá cây. Nếu bạn biết được mình có tiếp xúc một trong những loại này, xin trả lời CÓ cho những câu hỏi thích hợp dưới dây.

83. BẠN CÓ TRỰC TIẾP TIẾP XÚC (qua sự hít vào, uống nước bị ô nhiễm, tiếp xúc vào da, v.v.) THUỐC DIỆT CỎ TẠI VIỆT NAM KHÔNG?
(1) Có (2) Không (3) Không rõ
NẾU KHÔNG, XIN TRẢ LỜI TIẾP PHẦN SAU (Hệ Thống Bắp Thịt và Xương Cốt, bắt đầu với câu hỏi số 100, trang 10).
NẾU CÓ, XIN GHI RÕ LÀ BẠN CHO RẰNG MÌNH ĐÃ TIẾP XÚC LOẠI THUỐC DIỆT CỎ NÀO?

Hoa chất màu cam	(1)
Hoa chất màu cam II	(2)
Hoa chất màu trắng	(3)
Hoa chất màu xanh trời	(4)
Hoa chất màu tím	(5)
Hoa chất màu hường	(6)
Hoa chất màu xanh lá cây	(7)

84. BẠN CÓ GIÚP CHO QUÂN ĐỘI HOA KỲ TRONG VIỆC PHUN HÓA CHẤT VỚI BẤT CỨ CHỨC VỤ NÀO (ví dụ như người đổ hóa chất, người di chuyển hóa chất trong kho hoặc chuyên chở, v.v.)? (1) Có (2) Không

85. NẾU BẠN TRẢ LỜI CÓ CHO CÂU HỎI SỐ 84, KHI TIẾP XÚC THÌ BẠN Ở ĐÂU? (Xin tham chiếu những trang B, B' và B" kèm dây. Xin ghi rõ số và địa điểm thích hợp mà bạn ở khi tiếp xúc).

86. BẠN BỊ TIẾP XÚC BAO LÂU? (1) Từ 1 đến 4 tháng
(2) Từ 5 đến 8 tháng (3) Từ 9 đến 12 tháng
(4) Khoảng thời gian khác _____
Xin ghi rõ

87. BẠN CÓ BỊ HẬU QUẢ TỨC THỜI GÌ KHÔNG? (1) Có (2) Không
NẾU CÓ, XIN GHI RÕ _____

88. BẠN CÓ GIÚP KHAI QUANG VÀ/HAY TUẦN TIỄU QUANH DOANH TRẠI, ĐƯỜNG LỘ, HOẶC VÙNG BẮN TỰ DO ĐANG ĐƯỢC KHAI QUANG KHÔNG?
(1) Có (2) Không

89. NẾU BẠN TRẢ LỜI CÓ CHO CÂU HỎI SỐ 88, BẠN Ở ĐỊA ĐIỂM NÀO KHI TIẾP XÚC? (Xin tham chiếu trang B, B' và B" kèm dây. Xin ghi rõ số và địa điểm thích hợp nơi bạn ở khi tiếp xúc).

_____
Địa Điểm

90. BẠN BỊ TIẾP XÚC BAO LÂU? (1) Từ 1 đến 4 tháng
(2) Từ 5 đến 8 tháng (3) Từ 9 đến 12 tháng
(4) Khoảng thời gian khác _____
Xin ghi rõ

91. BẠN CÓ BỊ HẬU QUẢ TỨC THỜI GÌ KHÔNG? (1) Có (2) Không

92. BẠN CÓ NGỦ LẠI HAY ĐI XUYÊN QUA VÙNG MỚI ĐƯỢC PHUN HÓA CHẤT KHÔNG?
(1) Có (2) Không
NẾU KHÔNG, XIN TRẢ TIẾP CÂU HỎI SỐ 96

93. NẾU BẠN TRẢ LỜI CÓ CHO CÂU HỎI SỐ 92, BẠN Ở ĐỊA ĐIỂM NÀO KHI BỊ TIẾP XÚC? (Xin tham chiếu trang B, B' và B" kèm dây. Xin ghi rõ số và địa điểm thích hợp nơi bạn ở khi tiếp xúc).

_____
Địa Điểm

94. BẠN BỊ TIẾP XÚC BAO LÂU? (1) Từ 1 đến 4 tháng
(2) Từ 5 đến 8 tháng (3) Từ 9 đến 12 tháng
(4) Khoảng thời gian khác _____
Xin ghi rõ

95. BẠN CÓ BỊ HẬU QUẢ TỨC THỜI GÌ KHÔNG? (1) Có (2) Không
NẾU CÓ, XIN GHI RÕ _____

96. BẠN CÓ THỂ BỊ TIẾP XÚC BẰNG CÁCH KHÁC NHƯ CHUYÊN CHỞ THUỐC DIỆT CỎ, Ở NGOÀI VIỆT NAM, UỐNG NƯỚC, LÀM VIỆC ĐỒNG ÁNG, V.V. KHÔNG?
(1) Có (2) Không
NẾU KHÔNG, XIN TRẢ LỜI TIẾP NHỮNG CÂU HỎI BẮT ĐẦU TỪ SỐ 100.

97. TẠI ĐỊA ĐIỂM NÀO Ở VIỆT NAM HOẶC Ở NƠI KHÁC (Xin tham chiếu trang B, B' và B" kèm dây. Xin ghi rõ số và địa điểm thích hợp nơi bạn ở khi bị tiếp xúc).

_____
Địa Điểm

98. BẠN BỊ TIẾP XÚC BAO LÂU? (1) Từ 1 đến 4 tháng
(2) Từ 5 đến 8 tháng (3) Từ 9 đến 12 tháng
(4) Khoảng thời gian khác _____
Xin ghi rõ

99. BẠN CÓ BỊ HẬU QUẢ TỨC THỜI GÌ KHÔNG? (1) Có (2) Không
NẾU CÓ, XIN GHI RÕ _____

HỆ THỐNG BẮP THỊT VÀ XƯƠNG CỐT: Xin mô tả nếu bạn bị bóp bất thường (unusal tightening), tê cong, dấu, sưng hay cứng tại bất cứ một khớp xương nào sau dây (không phải vì tập tành hay dùng sức quá độ) trong khi bạn còn ở Việt Nam, hay từ khi rời khỏi Việt Nam. Xin ghi rõ nếu bạn không có cảm giác này.

BẠN CÓ HỀ BAO GIỜ CÓ CẢM GIÁC BẤT THƯỜNG Ở:

		Ngứa	Tê cóng	Sưng	Cứng	Đau	Không sao
100.	Tay bạn	(1)	(2)	(3)	(4)	(5)	(6)
101.	Ngon tay bạn	(1)	(2)	(3)	(4)	(5)	(6)
102.	Cổ tay bạn	(1)	(2)	(3)	(4)	(5)	(6)
103.	Khiu tay bạn	(1)	(2)	(3)	(4)	(5)	(6)
104.	Cánh tay bạn	(1)	(2)	(3)	(4)	(5)	(6)
105.	Vai bạn	(1)	(2)	(3)	(4)	(5)	(6)
106.	Háng bạn	(1)	(2)	(3)	(4)	(5)	(6)
107.	Đầu gối bạn	(1)	(2)	(3)	(4)	(5)	(6)
108.	Mắt cá chân bạn	(1)	(2)	(3)	(4)	(5)	(6)
109.	Chân bạn	(1)	(2)	(3)	(4)	(5)	(6)
110.	Ngón chân bạn	(1)	(2(	(3)	(4)	(5)	(6)
111.	Cổ bạn	(1)	(2)	(3)	(4)	(5)	(6)

112. BẠN LÀM VIỆC GÌ Ở VIỆT NAM? _____

_____
Xin ghi rõ

DANH SÁCH A

Xin tham chiếu những chất liệt kê trên danh sách này để trả lời những câu hỏi về việc tiếp xúc hóa chất.

phóng xạ nguyên tử
a-mô-ni-ác
át-xít
chất kiềm
thạch miên
ben-zin
be-ri-li-om
cat-mi-om
bụi đồ sứ
lục khí
cơ-rom
thuốc để chùi sạch (nước dung môi)
bụi than
nhựa than
chất bạch kim
bụi bông
nước dung môi làm tan mỡ
nơi làm việc bụi bặm
thuốc nhuộm
khói thoát hơi
thủy tinh có thớ (fibrous glass)/ len đá (rock wool)
chất flourides
hơi nóng (quá độ)
hóa chất diệt cỏ
vật liệu cách nhiệt
hơi làm cho ngứa
khói hay mù làm cho ngứa
dầu máy/dầu để cắt
thủy ngân
bụi kim khí
khói kim khí
bụi khoáng chất (đất nhị nguyên tử, tri thạch, phếu hay lước trần châu ngâm thuốc về phân tử)
tinh khoáng chất
đào mỏ
kền
tiếng động (lớn)
sơn
hóa chất diệt thú vật
tinh dầu hỏa
chất PCB (polychlorirated biphenyls)
phê-nôn
nhựa hóa học/nhựa cây
vật liệu có chất phóng xạ
chất si-li-ca hay quartz
nước dung môi hay thuốc để chùi sạch
mía
dầu máy biến đổi/dầu máy tụ điện
u-ra-ni-om
va-na-di-om
vinul chloride
khói hàn xì
quang tuyến X


DMZ
Dong Ha
Quang Tri
Hue (Camp Evans)
Da Nang
Hoi An
Chu Lai
Dak To
An Khe
Pleiku
Phu Cat
Ia Drang Valley
Tuy Hoa
Phu Hiep
Ban Me Thuot
Nha Trang
Cam Ranh Bay
Phan Rang
FISH HOOK
Cuan Loi
Iron Triangle
PARROT'S BEAK
Xuan Loc
Bien Hoa
SAIGON
Tan An
Long Thinh
Phan Thiet
Dong Tam
Vung Tau
My Tho
Rach Gia
Can Tho
MEKONG DELTA
CAMAU PENINSULA

DANH SÁCH B'

Xin dùng danh sách này để chỉ rõ nơi bạn ở tại Việt Nam. Xin ghi rõ số của làng hay căn cứ vào khoảng trống của những câu hỏi trang 10, 11, 12 và 13.

QUÂN ĐOÀN I

Nơi	Số	Nơi	Số
Đông Hà	001	Huế	011
Đồi Hamburger	002	Hội An	012
Trại Carroll	003	Phú Bài	013
Thung lũng Ashau	004	Trại Eagle	014
Khe Sanh	005	Tam kỳ	015
Đà Nẵng	006	Trà Bồng	016
Chu Lai	007	Đức Phổ	017
Quảng Ngãi	008	Phú Lộc	018
Khâm Đức	009	FSB Tomawak	019
Quảng Trị	010	Nơi khác	020

Xin ghi rõ _____

Xin ghi rõ _____

QUÂN ĐOÀN II

Nơi	Số	Nơi	Số
Dak Pek	021	Dalat	043
Dak Tô	022	Phan Thiết	044
Bến Hết	023	Sông Mao	045
Plei Kleng	024	Phan Rang	046
Căn Cứ Tác Xạ November	025	Vịnh Cam Ranh	047
Kontum	026	Đồng Bà Thin	048
Pleiku	027	Nha Trang	049
Trại Holloway	028	Khánh Dương	050
Trại Enarl	029	Đức Mai	051
LZ X ray	030	Phú Hiệp	052
Oasis	031	Tuy Hòa	053
Ban Blech	032	Đồng Tre	054
Bạn Mê Thuột	033	Phú Túc	055
Đức Lập	034	Che Rẹp	056
Qui Nhơn	035	Văn Canh	057
Phú Cát	036	Thung lũng Rok	058
Hammound	037	Căn Cứ Tác Xạ Copperhead	059
Bồng Sơn	038	Dầu Tang	060
Thung lũng An Loa	039	Củ Chi	061
LZ English	040	An Khê	062
Nhơn Cơ	041	Rừng Hố Bò	063
Bảo Lộc	042	Nơi khác	064

Xin ghi rõ _____

Xin ghi rõ _____

DANH SÁCH B"

Xin dùng danh sách này để chỉ rõ nơi bạn ở tại Việt Nam. Xin ghi rõ số của làng hay căn cứ vào khoảng trống của những câu hỏi trang 10, 11, 12 và 13.

QUAN ĐOÀN III

Nơi	Số	Nơi	Số
Đức Phong	065	Bear Cat	080
Sông Bé	066	Long Binh	081
Bù Đốp	067	Long Giao	082
Fish Hook	068	Hàm Tân	083
Lộc Ninh	069	Tam Giác Sắt	084
Núi Black Virgin	070	Swan Lộc	085
Tây Ninh	071	Phú Vinh	086
Mỏ Vet	072	Tân Sơn Nhứt	087
Lai Khê	073	Dầu Tiếng	088
Phú Lợi	074	Lô Cốt French	089
Biên Hòa	075	Katum	090
Saigon	076	Quan Lợi	091
Long Thinh	077	Xuân Lộc	092
Vũng Tàu	078	Nơi khác	093
Củ Chi	079		

Xin ghi rõ _____

Xin ghi rõ _____

QUAN ĐOÀN IV

Nơi	Số	Nơi	Số
Mộc Hóa	094	Cần Thơ	101
An Lon	095	Mekong Delta	102
Rạch Giá	096	Vĩnh Long	103
Rừng U Minh	097	Đồng Tâm	104
Cau Mau	098	Mỹ Tho	105
Sóc Trang	099	Nơi khác	106
Tân An	100		

Xin ghi rõ _____

Xin ghi rõ _____

ABOUT OUR STUDY

Agent Orange, in this study, is used as a catch-all word for the herbicides used during the spraying program from approximately 1964 to 1970. Agent Orange and the other herbicides used over South Vietnam were used to defoliate plants and trees to deny their use as cover and to destroy rice crops.

Agent Orange was, for the most part, sprayed by planes to cover large areas. Additionally, spraying was also done from helicopters and by hand spraying equipment. This is why it is so important to get an idea of just where and when you spent time in South Vietnam--your exposure will vary depending on these factors.

Questions of the health effects of Agent Orange have been raised since 1970, in relation to their use during the Second Indochina War. This study is an attempt to compare possibly exposed populations, with people who were not exposed, to see what health effects (if any) resulted from being exposed.

Important notes:

* This study is being done totally independent of any government. Your participation will not result in any compensation from any government for adverse health effects!

* Your answers will be kept closely guarded! No one will be identified by name in any way. Your completed questionnaire will be kept completely confidential.

CONSENT AGREEMENT

Your participation in this study is completely voluntary and you may refuse to answer any questions or stop participating in the study at any time.

Participation of those taking this questionnaire will help better understand potential risks associated with exposure to herbicides in Vietnam.

Information is being collected only for this study. All information collected from you will be kept confidential. No information that identifies any individual will be released, and the results of the study may be published only as statistical summaries.

* * *

I hereby certify that I understand the information presented above (and in the introduction on the attached questionnaire) and agree to participate.

Signature:_____ Date:_____

* * *

QUESTIONNAIRE

Date_____ Number_____

The purpose of this study is to perform a risk-factor analysis to determine if involuntary exposure to chemical substances (herbicides, in particular) causes those exposed to suffer from increased illness due to such exposure. Questions also are intended to discover whether children of Vietnam Veterans or native Vietnamese, recently immigrated, are at increased risk of congenital abnormalities.

This survey is being conducted by Dave Weller, a graduate student at San Jose State University. The study is under the guidance of a number of his professors.

Please mark your answers on this questionnaire. Darken in the number which corresponds to your answer (see EXAMPLE below). When an additional response is required, use the space provided on this questionnaire. Some questions call for more than one answer.

Please note that attachments to this questionnaire are available to assist you in answering certain questions.

EXAMPLE:

Are you happy today? (1)Yes (2)No

If you are happy today, then you would darken in the (1) space. If you are not happy today, then you would darken in the (2) space on this questionnaire.

Some questions may seem irrelevant or too personal, but your honest answers to all questions may help uncover problems of exposure to chemical agents in Vietnam.

* * *

THE CONFIDENTIALITY OF YOUR RESPONSES WILL BE CLOSELY GUARDED!

YOUR COOPERATION IS SINCERELY APPRECIATED!

* * *

1. SEX: (1)Male (2)Female

2. AGE: (1)25 to 29 years (2)30 to 34 years

(3)35 to 39 years (4)40 to 44 years (5)45 years and older

3. ETHNIC ORIGIN: (1)Vietnamese (2)Chinese

(3)Other_____
specify

4. WHAT IS YOUR PRESENT OCCUPATION? (1)Business

(2)Restaurant (3)Technical worker (4)Support services

(5)Other_____
specify (e.g., professional, student, unemployed, etc.)

5 DID YOU SERVE IN THE MILITARY? (1)Yes (2)No

6. IF YES TO #5 ABOVE, WHICH BRANCH OF THE MILITARY WERE YOU IN?

(1)Army of the Republic of Vietnam (2)Air Force

(3)Civilian employee (e.g., Red Cross, A.I.D., etc.)

(4)Civilian employee in military service

(5)Other_____
specify

7. WERE YOU IN VIETNAM THE ENTIRETY OF THE WAR?

(1)Yes (2)No

8. IF NO TO #7, PLEASE INDICATE DURING WHICH PERIODS YOU WERE OUT OF VIETNAM (for longer than 3 months).

1st period- From_____ _____ TO _____ _____
month year month year

2nd period- From_____ _____ TO _____ _____
month year month year

9. DID YOU SERVE OUTSIDE VIETNAM FOR MORE THAN SIX (6)MONTHS?

(1)Yes (2)No (3)Not applicable/no answer

If YES, where did you serve for the longest period of time?

_____
location

Date_____ _____ TO _____ _____
month year month year

10. IF YES TO #9, TO YOUR KNOWLEDGE, WERE AGRICULTURAL CHEMICALS (e.g., herbicides) USED IN THIS AREA?

(1)Yes (2)No (3)Don't know

If YES, do you know what agricultural chemicals were used, and for how long?

chemical used	length of use

WERE YOU DIAGNOSED AS HAVING ANY OF THE FOLLOWING INFECTIOUS DISEASES WHILE LIVING IN VIETNAM, AND DID YOU RECEIVE TREATMENT? [NOTE: these questions may require two (2) answers]

		DIAGNOSED? YES	DIAGNOSED? NO	TREATED? YES	TREATED? NO
11.	Intestinal worms	(1)	(2)	(3)	(4)
12.	Tuberculosis	(1)	(2)	(3)	(4)
13.	Serum Hepatitis (Hepatitis B)	(1)	(2)	(3)	(4)
14.	Infectious Hepatitis (Hepatitis A)	(1)	(2)	(3)	(4)
15.	Amebic or bacterial dysentery	(1)	(2)	(3)	(4)
16.	Venereal Disease	(1)	(2)	(3)	(4)
17.	Malaria	(1)	(2)	(3)	(4)

18. IF TREATMENT WAS RECEIVED FOR MALARIA, WAS DAPSONE GIVEN?

(1)Yes (2)No (3)Don't know

19.	Other_____ specify	(1)	(2)	(3)	(4)
20.	Other_____ specify	(1)	(2)	(3)	(4)

OCCUPATIONAL ENVIRONMENT: SINCE LEAVING VIETNAM, TO YOUR KNOWLEDGE, HAVE YOU BEEN EXPOSED ON A REGULAR BASIS TO:

21. Chemicals? (1)Yes (2)No (3)Don't know

22. Radiation? (1)Yes (2)No (3)Don't know

IF YOU ANSWERED NO TO NUMBERS 21 AND 22, GO ON TO #27.

IF YOU ANSWERED YES TO EITHER OR BOTH OF THE ABOVE, PLEASE ANSWER NUMBERS 23 THROUGH 26.

23. HAVE YOU BEEN EXPOSED TO CHEMICALS, AT A PLACE OF EMPLOYMENT, WITHIN THE LAST YEAR?

(1)Yes (2)No (3)Don't know

24. HAVE YOU BEEN EXPOSED TO CHEMICALS, AT A PLACE OF EMPLOYMENT, WITHIN THE LAST TWO (2) TO TEN (10) YEARS?

(1)Yes (2)No (3)Don't know

25. HAVE YOU BEEN EXPOSED TO RADIATION (except dental or chest x-rays) WITHIN THE LAST YEAR?

(1)Yes (2)No (3)Don't know

If YES, from what source and for how long were you exposed?

_____

26. HAVE YOU BEEN EXPOSED TO RADIATION (except dental or chest x-rays) WITHIN THE LAST TWO (2) TO TEN (10) YEARS?

(1)Yes (2)No (3)Don't know

If YES, from what source and for how long were you exposed?

_____

OTHER EXPOSURES:

27. HAVE YOU BEEN EXPOSED TO A CHEMICAL(S) IN THE LAST TEN (10) YEARS WHILE PRACTICING A HOBBY OR WHILE DOING OTHER ACTIVITIES AT HOME OR IN OTHER NON-OCCUPATIONAL SETTINGS (Please refer to attached list "A")?

(1)Yes (2)No (3)Don't know

If YES to #27, please list the three (3) most common chemical exposures in non-work settings during the last ten (10) years.

_____

chemical duration of exposure how often exposed

_____

chemical duration of exposure how often exposed

_____

chemical duration of exposure how often exposed

PERSONAL HABITS:

28. HAVE YOU EVER USED TOBACCO PRODUCTS? (1)Yes (2)No

29. IF YOU ANSWERED YES TO #28, WHICH TOBACCO PRODUCTS WERE USED?
(1)Cigarettes (2)Cigars (3)Pipe (4)Chewing tobacco
(5)All of the above (6)Other

30. DO YOU CURRENTLY USE TOBACCO PRODUCTS? (1)Yes (2)No
If YES, how long have you used these products?_____

31. IF YOU ANSWERED YES TO #30, HOW MUCH DO YOU USE?
(1)Less than 1 pack/day (2)Between 2 to 4 packs/day
(3)More than 4 packs/day (4)1 to 3 pinches or pouches/day
(5)A cigar or pipeful/day (6)More than a cigar or pipeful/day

32. DO YOU DRINK BEER? (1)Yes (2)No

33. IF YES TO #32, HOW MUCH BEER DO YOU DRINK?
(1)Less than 6 cans or bottles/day
(2)6 to 12 cans or bottles/day
(3)More than 12 cans or bottles/day

34. DO YOU DRINK HARD LIQUOR? (1)Yes (2)No

35. IF YES TO #34, HOW MUCH HARD LIQUOR DO YOU DRINK?
(1)Less than 2 drinks/day (2)2 to 5 drinks/day
(3)More than 5 drinks/day

36. DO YOU DRINK WINE? (1)Yes (2)No

37. IF YES TO #36, HOW MANY GLASSES PER DAY?
(1)Less than 2 glasses/day (2)2 to 5 glasses/day
(3)More than 5 glasses/day

GENETIC HISTORY:

38. ANY BIRTH DEFECTS, GENETIC DISORDERS, OR INHERITED DISEASES DIAGNOSED AFFECTING YOU OR YOUR FAMILY?

(1)Yes (2)No

If YES, please specify_____

39. AN BIRTH DEFECTS, GENETIC DISORDERS, OR INHERITED DISEASES DIAGNOSED AFFECTING THE FAMILY OF ANY MATE WITH WHOM YOU HAVE HAD A CHILD?

(1)Yes (2)No (3)Don't know

If YES, please specify_____

40. HAVE YOU AND YOUR MATE HAD DIFFICULTY CONCEIVING (trying unsuccessfully for 1 year) OR BEEN DIAGNOSED AS BEING INFERTILE?

(1)Yes (2)No

If YES, please specify_____

41. DID YOU HAVE CHILDREN BEFORE (approximately 1965) AMERICAN INVOLVEMENT IN VIETNAM?

(1)Yes (2)No

42. IF YES TO #41, WERE/ARE THEY PHYSICALLY AND MENTALLY HEALTHY?

(1)Yes (2)No

If NO, please specify_____

43. HAVE YOU HAD CHILDREN AFTER (approximately 1975) AMERICAN INVOLVEMENT ENDED?

(1)Yes (2)No

44. IF YES TO #43, WERE/ARE THEY PHYSICALLY AND MENTALLY HEALTHY?

(1)Yes (2)No

If NO, please specify_____

HEALTH HISTORY:

45. DID YOU EVER HAVE ACNE AS A YOUTH? (1)Yes (2)No

46. DID IT CLEAR UP? (1)Yes (2)No

47. DID YOU EVER HAVE ACNE AS AN ADULT? (1)Yes (2)No

48. DID YOU EVER HAVE AN ACNE-LIKE OUTBREAK DURING AMERICAN INVOLVEMENT IN THE VIETNAM WAR?

(1)Yes (2)No (3)Don't recall/No answer

49. DID YOU EVER HAVE AN ACNE-LIKE OUTBREAK AFTER AMERICAN INVOLVEMENT IN THE VIETNAM WAR?

(1)Yes (2)No (3)Don't recall/No answer

50. IF YOU ANSWERED YES TO #48 OR #49 ABOVE, WHERE DID IT OCCUR? [NOTE: more than 1 answer may be required]

(1)Under your eyes (2)On your arms (3)On your trunk

(4)On your neck (5)Behind your ears (6)On your feet

(7)On your legs

51. HAVE YOU EVER EXPERIENCED A CHANGE IN YOUR SKIN COLOR (unrelated to sunburning)?

(1)Yes (2)No (3)Don't know

52. IF YOU ANSWERED YES TO #51, DID YOUR SKIN BECOME

(1)Lighter (2)Darker (3)No change

53. DID IT OCCUR (1)Before (2)During (3)After AMERICAN INVOLVEMENT?

54. HAVE YOUR EYES BEEN MORE SENSITIVE THAN NORMAL TO LIGHT?

(1)Yes (2)No (3)Don't know

55. DID IT OCCUR (1)Before (2)During (3)After AMERICAN INVOLVEMENT?

56. HAS ANY OTHER PART OF YOUR BODY SHOWN AN INCREASED SENSITIVITY TO LIGHT?

(1)Yes (2)No (3)Don't recall

57. IF YES TO #56, HAVE YOU DEVELOPED ANY OF THE FOLLOWING?

(1)Blisters (2)Sores (3)Worsening of rash

(4)Other_____

58. HAVE YOU EVER NOTICED A CHANGE IN YOUR HAIR COLOR OR PATTERN (beyond normal balding)?

(1)Yes (2)No (3)Don't recall

59. IF YES TO #58, WHAT DID YOU NOTICE? [NOTE: more than 1 answer may be required]

(1)More hair (2)Less hair (3)Lighter hair (4)Darker hair

60. DID THIS OCCUR (1)Before (2)During (3)After AMERICAN INVOLVEMENT?

HAVE YOU EVER BEEN TOLD BY A DOCTOR THAT YOU HAD ANY OF THE FOLLOWING CONDITIONS? PLEASE INDICATE THE YEAR THAT THE CONDITION FIRST BEGAN.

		YES	NO	YEAR DIAGNOSED?
61.	Hay fever	(1)	(2)	
62.	Allergies	(1)	(2)	
63.	High blood pressure	(1)	(2)	
64.	Heart condition	(1)	(2)	
65.	Epilepsy	(1)	(2)	
66.	Kidney disease	(1)	(2)	
67.	Anemia	(1)	(2)	
68.	Liver condition/ disease	(1)	(2)	

_____
please specify

69.	Benign, fatty tumors or cysts	(1)	(2)	

_____
please specify

70.	Other tumors or cancer	(1)	(2)	

_____
please specify

GENERAL HEALTH:

71. DO YOU SLEEP WELL? (1)Yes (2)No

72. HAVE YOU LOST 20 OR MORE POUNDS, SINCE LEAVING VIETNAM, WITH NO CHANGE IN YOUR DIET?

(1)Yes (2)No

73. HAVE YOU EVER EXPERIENCED LOSS OF APPETITE?

(1)Yes (2)No

74. HAVE YOU OR YOUR FAMILY NOTICED A PERSONALITY CHANGE IN YOU?

(1)Yes (2)No

75. DO YOU REGULARLY (not just once in awhile) SHOW SIGNS OF THE FOLLOWING? [NOTE: more than 1 response may be needed]

(1)Depression (2)Rage (3)Anxiety (4)Irritable

(5)Other_____
specify

76. HAVE YOU EVER SUFFERED MENTAL ILLNESS OR BREAKDOWN?

(1)Yes (2)No

77. IF YES TO #76, DID IT OCCUR (1)Before (2)During

(3)After AMERICAN INVOLVEMENT IN THE WAR?

78. WAS THERE ANY CHANGE IN YOUR NORMAL DESIRE FOR SEX?

(1)Yes (2)No (3)Don't know/No answer

79. IF YES TO #78, DID THIS OCCUR (1)Before (2)During

(3)After AMERICAN INVOLVEMENT IN THE WAR?

80. IF YES TO #78, IS YOUR DESIRE FOR SEX (1)Increased?

(2)Decreased? (3)Completely lost?

81. DO YOU HAVE ANY DIFFICULTIES IN MAINTAINING SEXUAL AROUSAL?

(1)Yes (2)No (3)Don't know/No answer

82. IF YES TO #81, DID THIS OCCUR (1)Before (2)During

(3)After AMERICAN INVOLVEMENT IN THE WAR?

HERBICIDE EXPOSURE: In this section we are interested in finding what you remember about being exposed to defoliating herbicides, such as Agent Orange, which were used to kill jungle cover, etc., in Vietnam. If you believe you were exposed to

such a chemical agent, either directly by involvement in its use (unloading, spraying, etc.), or entering a freshly sprayed area. We would like you to describe how you were exposed and when. Please refer to the attached map marked "B".

NOTE: Agent Orange will be used as a "catch all" name. Other herbicides were used in Vietnam, including Agents White, Blue, Orange II, Purple, Pink and Green. If you know you were exposed to one of these, answer YES to the appropriate question below.

83. WERE YOU DIRECTLY EXPOSED (through inhalation, drinking contaminated water, skin contact, etc.) TO HERBICIDES IN VIETNAM?

(1)Yes (2)No (3)Don't know

If NO, please go onto the next section (Muscle and Bone System, starting with Question 100, page 13).

If YES, please indicate to which herbicide(s) you believe you may have been exposed:

Agent Orange	(1)
Agent Orange II	(2)
Agent White	(3)
Agent Blue	(4)
Agent Purple	(5)
Agent Pink	(6)
Agent Green	(7)

84. DID YOU ASSIST THE AMERICAN MILITARY IN THE SPRAY PROGRAM IN ANY CAPACITY (e.g., as a loader, handler during storage or shipment, etc.)?

(1)Yes (2)No

If NO, proceed to Question #88.

85. IF YES TO #84, AT WHAT LOCATION WERE YOU WHEN EXPOSED? [Please refer to the attached sheets designated B, B' and B". Indicate by the appropriate number(s) the location(s) where you were when exposed]

_____

locations

86. FOR HOW LONG WERE YOU EXPOSED? (1)Between 1 and 4 months

(2)Between 5 and 8 months (3)Between 9 and 12 months

(4)Other_____
specify

87. DID YOU EXPERIENCE ANY IMMEDIATE EFFECTS? (1)Yes (2)No

If YES, please specify_____

88. DID YOU ASSIST IN CLEARING VEGETATION AND/OR PATROLLING AROUND CAMPS, ROADS, OR CLEARING FREE-FIRE ZONES?

(1)Yes (2)No

If NO, proceed to Question #92.

89. IF YES TO #88, AT WHAT LOCATION WERE YOU WHEN EXPOSED? [Please refer to the attached sheets designated B, B' and B". Indicate by the appropriate number(s) the location(s) where you were when exposed]

_____
location(s)

90. FOR HOW LONG WERE YOU EXPOSED? (1)Between 1 and 4 months

(2)Between 5 and 8 months (3)Between 9 and 12 months

(4)Other_____
specify

91. DID YOU EXPERIENCE ANY IMMEDIATE EFFECTS? (1)Yes (2)No

If YES, please specify _____

92. DID YOU SLEEP IN OR WALK THROUGH AREAS RECENTLY SPRAYED?

(1)Yes (2)No

If NO, proceed to Question #96.

93. IF YES TO #92, AT WHAT LOCATION WERE YOU WHEN EXPOSED? [Please refer to the attached sheets designated B, B' and B". Indicate by the appropriate number(s) the location(s) where you were when exposed]

_____
location(s)

94. FOR HOW LONG WERE YOU EXPOSED? (1)Between 1 and 4 months

(2)Between 5 and 8 months (3)Between 9 and 12 months

(4)Other_____
specify

95. DID YOU EXPERIENCE ANY IMMEDIATE EFFECTS? (1)Yes (2)No

If YES, please specify_____

96. WERE YOU POSSIBLY EXPOSED IN OTHER WAYS, SUCH AS, TRANSPORTING HERBICIDES OUTSIDE OF VIETNAM, DRINKING THE WATER, DOING FIELD WORK, ETC.?

(1)Yes (2)No

If NO, proceed to the next series of questions, starting at #100.

97. AT WHAT LOCATION(S) IN VIETNAM OR ELSEWHERE? [Please refer to the attached sheets designated B, B' and B". Indicate by the appropriate number(s) the location(s) where you were when exposed]

_____
location(s)

98. FOR HOW LONG WERE YOU EXPOSED? (1)Between 1 and 4 months

(2)Between 5 and 8 months (3)Between 9 and 12 months

(4)Other_____
specify

99. DID YOU EXPERIENCE ANY IMMEDIATE EFFECTS? (1)Yes (2)No

If YES, please specify_____

MORE

MUSCLE AND BONE SYSTEM: Please describe if you've experienced unusual tightening, numbness, pain, swelling or stiffness in any of the following joints (not associated with exercise or exertion) while still in Vietnam, or since leaving. Please indicate if you do not have these feelings.

DO YOU EVER EXPERIENCE ANY OF THE FOLLOWING UNUSUAL FEELINGS IN YOUR:

		Tingling	Numbness	Swelling	Stiffness	Pain	None
100.	Hands	(1)	(2)	(3)	(4)	(5)	(6)
101.	Fingers	(1)	(2)	(3)	(4)	(5)	(6)
102.	Wrists	(1)	(2)	(3)	(4)	(5)	(6)
103.	Elbows	(1)	(2)	(3)	(4)	(5)	(6)
104.	Arms	(1)	(2)	(3)	(4)	(5)	(6)
105.	Shoulders	(1)	(2)	(3)	(4)	(5)	(6)
106.	Hips	(1)	(2)	(3)	(4)	(5)	(6)
107.	Knees	(1)	(2)	(3)	(4)	(5)	(6)
108.	Ankles	(1)	(2)	(3)	(4)	(5)	(6)
109.	Feet	(1)	(2)	(3)	(4)	(5)	(6)
110.	Toes	(1)	(2)	(3)	(4)	(5)	(6)
111.	Neck	(1)	(2)	(3)	(4)	(5)	(6)

112. WHAT WAS (WERE) YOUR JOB(S) IN VIETNAM?_____

_____

LIST A

Use the substances placed on this list as a reference for answering questions dealing with substance exposure.

atomic (ionizing) radiation
ammonia
acids
alkalis or caustics
asbestos
benzene
beryllium
cadmium
ceramic dust
chemical dusts
chlorine
chromium
cleaning fluids (solvents)
coal dust
coal tar
cobalt
cotton dust
degreasing solvents
dusty work atmosphere
dyes
exhaust fumes
fibrous glass/rock wool
flourides
heat (extreme)
herbicide chemicals
insulation materials
irritating gasses
irritating fumes or mists
lead
machine oil/cutting oil
mercury
metal dusts
metal fumes
mineral dusts (diatomacious earth, vermiculite, perlite molecular sieve or filter
mineral spirits
mining
nickel
noise (loud)
paints
pesticide chemicals
petroleum distillate
PCBs (polychlorinated biphenyls)
phenol
plastics/resins
radioactive materials
silica or quartz
solvents or cleaning fluids
sugar cane
transformer fluid/capacitor fluids
uranium
vanadium
vinyl chloride
welding fumes
x-rays

APPENDIX F

The members of the local Vietnamese community who have signed below know or are acquainted with Dave Weller. They were asked to sign as an expression of trust that the information gathered from you will be kept confidential and will not be abused. My thanks to you for taking the questionnaire and to those who signed below.

TRAN, DUC

Van-Phi and Khanh Nguyen