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TEXAS VETERANS AGENT ORANGE

ASSISTANCE PROGRAM

TEXAS DEPARTMENT OF HEALTH

AUSTIN, TEXAS

A N N U A L R E P O R T

August 1985

Ron J. Anderson, M.D.
Chairman
Texas Board of Health

Robert Bernstein, M.D., F.A.C.P.
Commissioner of Health
Texas Department of Health

Texas Department of Health

Robert Bernstein, M.D., F.A.C.P.
Commissioner

Robert A. MacLean, M.D.
Deputy Commissioner
Professional Services

Hermas L. Miller
Deputy Commissioner
Management and Administration

1100 West 49th Street
Austin, Texas 78756-3199
(512) 458-7111

August 23, 1985

The Honorable Mark W. White
Governor of Texas
State Capitol
Austin, Texas 78711

Dear Governor White:

Enclosed is the Annual Report of the Texas Veterans Agent Orange Assistance Program. Pursuant to Section 3 of Article 4447w, VTCS, this report is being distributed to the Legislature, Veterans Administration, Texas Veterans Affairs Commission, veterans' organizations, and interested individuals. It reflects the work of the Texas Department of Health Agent Orange Program to date.

The report contains research findings on the effects of exposure to chemical defoliants or herbicides or other causative agents, including Agent Orange, and statistical information compiled from reports submitted by physicans, hospitals, and veterans.

I hope you find this report both useful and informative.

Sincerely,

Robert Bernstein, M.D., F.A.C.P.
Commissioner of Health

Enclosure

Texas Department of Health

Robert Bernstein, M.D., F.A.C.P.
Commissioner

Robert A. MacLean, M.D.
Deputy Commissioner
Professional Services

Hermas L. Miller
Deputy Commissioner
Management and Administration

1100 West 49th Street
Austin, Texas 78756-3199
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PREFACE

From 1962 to 1971 during the Vietnam conflict, 152,000 Texans serving in the military forces were exposed to varying amounts of herbicides used to kill or defoliate plants. Since that time veterans have attributed a number of illnesses to Agent Orange which contained a contaminating chemical (TCCD); known to be highly toxic to animals, yet not well understood in its effects on humans.

The Texas Veterans Agent Orange Assistance Program set into motion a cooperative program between the Texas Department of Health and the University of Texas System to assist these veterans in establishing claims through pilot clinical studies designed to establish the cause and effect relationship of exposed veterans and subsequent health problems. The University of Texas Agent Orange Project has selected 248 for study from whom 927 specimens have been analysed in the various protocols. To date no final results of the studies have been released since interpretation of the individual study reports requires correlation with controls and the results of the project as a whole.

Activities at the federal level have increased, as evidenced by the activities of the Agent Orange Epidemiological Study at the Centers for Disease Control, the VA Chloracne Task force and completion of the morbidity study phase of the Air Force Ranch Hand Study, and the release of the Birth Defect Study in Atlanta by the Centers for Disease Control.

Robert Bernstein, M.D., F.A.C.P.
Commissioner of Health

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Texas Department of Health

Robert Bernstein, M.D., F.A.C.P.
Commissioner

1100 West 49th Street
Austin, Texas 78756
(512) 458-7111 7251

Robert A. MacLean, M.D.
Deputy Commissioner
Professional Services

Hermas L. Miller
Deputy Commissioner
Management and Administration

DATE: August 5, 1985

TO: INTERESTED INDIVIDUALS AND ORGANIZATIONS

FROM: HARRIET FRANSON, Program Manager
Agent Orange Program

RE: TEXAS AGENT ORANGE PROGRAM STATUS REPORT FOR PERIOD ENDING JULY 31, 1985

Enclosed is the Texas Agent Orange Program Status Report for period ending July 31, 1985. This report is cumulative and reflects program activities since the inception of the program on September 1, 1981.

As you may be aware, the Texas Legislature this year did not approve continued funding for the Agent Orange Program. Therefore, funding will expire on August 31, 1985 with resulting curtailment of program activities. Program data analyses are anticipated and study results published.

It is our understanding that a nationwide search is underway for individuals to assist in the distribution plan for the $180 million settlement fund approved by the New York State Court in the class action suit against the seven chemical companies. Appointments will be made to an Advisory Group for the payment program, an Executive Director, and a Board of Directors for the Foundation. Names with resumes can be forwarded to Kenneth R. Feinberg, Suite 1150, 1575 Eye Street, N.W., Washington, D.C. 20005. The resumes should reflect relevant background and experience (see attached request).

KAYE, SCHOLER, FIERMAN, HAYS & HANDLER
1575 EYE STREET, N.W.
WASHINGTON, D.C. 20005

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KAY HX

For Release: June 7, 1985

PRESS RELEASE

Kenneth R. Feinberg, the Special Master reappointed by the Court in the Agent Orange litigation to help develop a distribution plan for the Settlement Fund, announced today that a nationwide search for individuals to assist in implementing the distribution plan approved by the Court would be undertaken as the first step in the distribution of the $180 million Fund.

The settlement is between the seven defendant chemical companies and the plaintiff class, which consists of those veterans who served in or near Vietnam from 1961 to 1972, who were exposed to Agent Orange and have injuries allegedly related to that exposure. The class also includes spouses and children of the veterans. Over 240,000 claims have been filed with the Court by class members seeking to participate in the settlement distribution.

The Court order requires a $150 million cash compensation program for veterans exposed to Agent Orange who are long-term totally disabled or to the families of those who have died, and a $45 million foundation to provide grants for services to the class, including those children of the class members suffering from birth defects.

The Court ordered that members of the class play a significant role in the governance of all aspects of the distribution plan. To that end, the Court ordered the Special Master to take appropriate steps leading to the recommendation of names to the Court for appointment to an Advisory Group for the payment program and a Board of Directors of the foundation. Both the Advisory Group and the Board of Directors are to be comprised primarily, but not exclusively, of class members.

The Special Master announced today that he is soliciting names from all interested groups or individuals who would be willing to serve either as an Advisory Group member or on the Board of Directors. The names will then be submitted to the Court for final review and appointment. All Advisors and Board members will serve without compensation, other than reimbursement of reasonable travel and other per diem expenses. The Advisory Group and the Board will be as representative of the class as possible, cutting across economic, social, racial, gender, geographic and occupational lines. Persons with management, investment, budget and foundation experience would be particularly desirable as members. Resumes showing relevant background and experience should be included with any suggestions of persons for consideration.

In another aspect of the outreach effort, Mr. Feinberg announced that a nationwide search would begin for an experienced professional to serve as Executive Director of the foundation. The Executive Director would administer the day-to-day operations of the foundation and would be compensated from the Fund. The Court will initially appoint the Executive Director, who will then serve at the pleasure of the Board of Directors. All inquiries or suggestions for the Advisory Group, the Board of Directors or the Executive Director should be directed, in writing with supporting data, to Kenneth R. Feinberg, Suite 1150, 1575 Eye Street, N.W., Washington, DC 20005.

The final outreach effort announced by the Special Master is the solicitation of insurance companies or other parties interested in bidding on contracts to implement the $150 million payment program. Contracts for claims processing, investment consulting, claims adjudication, and auditing will be finalized by the Court within the next few months. Contractors interested in receiving bid specifications or in obtaining information concerning the payment program should contact, in writing, Lawrence B. Novey, consultant to the Special Master, who can be reached at the same address as Mr. Feinberg.

TEXAS DEPARTMENT OF HEALTH

AUSTIN TEXAS

INTER-OFFICE

THROUGH: CHIEF, BUREAU OF EPIDEMIOLOGY
THROUGH: ASSOCIATE COMMISSIONER FOR PREVENTABLE DISEASES

THROUGH: DEPUTY COMMISSIONER FOR PROFESSIONAL SERVICES

FROM: GEORGE R. ANDERSON, M.D.
OCCUPATIONAL MEDICINE AND TOXICOLOGY/
AGENT ORANGE PROGRAM

TO: Robert Bernstein, M.D., F.A.C.P.
Commissioner of Health

SUBJECT: TEXAS VETERANS AGENT ORANGE ASSISTANCE PROGRAM
STATUS REPORT FOR 2 MONTH PERIOD ENDING JULY 31, 1985

REFERRALS	TOTAL (6/1/85-7/31/85)	TO DATE
No. of veterans referred into the program this reporting period (No. of deceased veterans--1: TOTAL 22)	29	1,962
Military and medical records have been requested for all referred veterans:		
Medical records reviewed to date: (Include VA and civilian records-- 105 reviewed this reporting period)		2,073
Military records reviewed to date: (include combat history, DD214, and/or medical--205 reviewed this reporting period)		1,795
No. of veterans referred into program and not in compliance with residency requirements--ineligible	2	18
CONTACTS		
Direct contacts from veterans this reporting period	39	1,352
By phone--31 (total to date: 981) By letter--6 (total to date: 326) By visit---2 (total to date: 51)		
Contact from News Media:	3	114
Channel 7 TV (Austin) Boston Globe Bryan Eagle (Bryan)		
Contact from or with other states/countries:	8	287
Massachusetts (1) West Virginia (1) Orgeon (1) Wisconsin (3) Washington (1)		

-CONTINUED-

SIGNED

DATE August 2, 1985

TEXAS DEPARTMENT OF HEALTH
AUSTIN TEXAS

INTER-OFFICE

FROM George R. Anderson, M.D. TO Robert Bernstein, M.D., F.A.C.P.

SUBJECT TEXAS VETERANS AGENT ORANGE ASSISTANCE PROGRAM
STATUS REPORT FOR 2 MONTH PERIOD ENDING JULY 31, 1985

Continuing contact with Legislative offices (State Representatives Larry Don Shaw & Jerry Yost) Office of the Governor, Office of the Attorney General, State Auditor, Congressman J.J. Pickle, Texas Department of Corrections, Texas Veterans Affairs Commission, Texas Land Commission, University of Texas System, Veteran's Administration, Vet Centers, Military Personnel Records Center, County Veteran Services Officers, Local Health Departments/Clinics, Other State Agent Orange offices, counseling services/physicians/hospitals, veterans' organizations, Dow Chemical Company, law firms, and students

9 followup letters were sent this reporting period to veterans who previously inquired about the program but not yet participating. (TOTAL TO DATE: 684)

Made/mailed 112 followup phone calls/letters to check on military/medical records requested but not yet received. (TOTAL TO DATE: 1,854)

One feedback letter was sent this reporting period to veteran in our program to apprise him of the status of his case (military/medical records received, pending, etc.). (TOTAL TO DATE: 540)

10 veterans in the program requested or were placed on inactive status this reporting period, primarily due to individuals moving with no forwarding addressess available (TOTAL TO DATE: 127) Inactive veterans resuming participation in the program. (TOTAL TO DATE: 6)

In response to our mailing to Texas veterans on the VA Agent Orange Registry received 0 completed questionnaire (TOTAL TO DATE: 1,511) of which 0 asked to be registered with the Texas Agent Orange Program (TOTAL TO DATE: 1,217).

5 veterans requested and were sent copies of case file records, in preparation for filing a claim: (TOTAL TO DATE: 27)

-CONTINUED-

SIGNED

DATE August 2, 1985

FROM George R. Anderson, M.D. TO Robert Bernstein, M.D., F.A.C.P.

SUBJECT TEXAS VETERANS AGENT ORANGE ASSISTANCE PROGRAM
STATUS REPORT FOR 2 MONTH PERIOD ENDING JULY 31,1985

PROTOCOL STUDIES

The second phase of the clinical studies has begun, with the following studies conducted this fiscal year:

Cytogenetics at UTS CANCER CENTER, Houston, by Dr. Hsu
Bleomycin Test at UTS, CANCER CENTER, Houston, by Dr. Hsu
Immune Profile at UT HEALTH SCIENCE CENTER, Houston, by Dr. Kerman
Uroporphyrins at UT HEALTH SCIENCE CENTER, Houston, by Dr. Kerman
Aryl Hydrocarbon Hydroxylase Induction at UT MEDICAL BRANCH, Galveston, by Dr. Ward

The protocols were published in summary and complete format.

Questionnaires received from selected veterans and proposed controls continue to be reviewed to establish proper matching of veterans with controls.

17 volunteer control questionnaires for the Agent Orange clinical studies were received. (TOTAL TO DATE: 148, of which 1 is TDH employee.

Contacts made with selected veterans and controls to make appointments for the collection of specimens.

Contacts made with the clinics/laboratories where specimens are to be collected/delivered.

53 appointments arranged for the collection of specimens (TOTAL TO DATE: 304). Total specimens collected for the 2nd/3rd collection of specimens for the Sperm Study (TOTAL TO DATE: 232). No reminder letters were sent re. collection of specimens (TOTAL TO DATE: 31). Collection of specimens for the Sperm Study is now completed.

-CONTINUED-

SIGNED _____

DATE August 2, 1985

FROM George R. Anderson, M.D. TO Robert Bernstein, M.D., F.A.C.P.

SUBJECT TEXAS VETERANS AGENT ORANGE ASSISTANCE PROGRAM
STATUS REPORT FOR 2 MONTH PERIOD ENDING JULY 31, 1985

111 letters were mailed to veterans concerning their participation in the clinical studies (TOTAL TO DATE: 459) and 55 to proposed controls (TOTAL TO DATE: 226).

Number of specimens collected and shipped to UTS:	(6/1/85 - 7/31/85)	TOTAL TO DATE
CYTOGENETICS STUDY	23	238
IMMUNE SUPPRESSION STUDY	23	237
UROPORPHYRIN	23	72
AHH (Enzymes)	13	58
SPERM STUDY	0	126
SPECIMEN NO. 2	0	99
SPECIMEN NO. 3	0	95
FAT TISSUE SPECIMEN	0	2

Two veteran/controls requested and were given results of individual study specimens analyses. (TOTAL TO DATE: 156)

SELECTION PROCESS FOR REFERRAL TO THE UTS SYSTEM

Review of cases is an ongoing process for eventual referral to the Agent Orange Selection Committee--700 were reviewed this period for referral to the committee.

To date the Selection Committee has reviewed 1,103 cases (147 being reviewed more than once), of which 248 have been selected for the clinical studies (of which 126 are for inclusion in the second study phase). 95 veterans have also been selected as possible low-risk controls.

BROCHURES/POSTERS

To date approximately 35,500 brochures and 7,726 posters have been mailed. In addition to individual requests, brochures and posters have been provided to veterans' organizations, county service officers, clinics/hospitals, and other states.

-CONTINUED-

SIGNED

DATE August 2, 1985

FROM George R. Anderson, M.D. TO Robert Bernstein, M.D., F.A.C.P.

SUBJECT TEXAS VETERANS AGENT ORANGE ASSISTANCE PROGRAM Page 5
STATUS REPORT FOR 2 MONTH PERIOD ENDING JULY 31, 1985

MAINTAINING STATISTICAL INFORMATION

Information is compiled each month from case files concerning the following medical conditions reported and substantiated by medical records. This information is provided to the Agent Orange Selection Committee and becomes part of our data information. Such information will be compiled for other medical conditions as the need arises.

Cancer in Veterans Under Age 36	Current Rashes
Cancer in Veterans Over Age 36	Children with Leg Deformities
Tingling/Numbness in Extremities	Miscarriages/Stillbirths
Post Traumatic Stress Disorder (PTSD)	Schizophrenia

Diagnoses continue to be coded with International Code for computer entry.

AGENT ORANGE ADVISORY COMMITEE

No meetings were held during this reporting period.

SPECIAL ACTIVITIES

Continue review of available literature for research on Agent Orange and related topics.

Continue to purchase publications for reference library.

Extraction of statistical data from case files concerning specific military data and medical conditions, etc.

Utilize word processor for the storage/retrieval of data and for multiple reproduction of originally-typed letters when form letters are not warranted.

In-house training on use of computer equipment for Richard Smith and Harriet Franson (d-Base and Software Users Group) continues.

-CONTINUED-

SIGNED

DATE August 2, 1985

TEXAS DEPARTMENT OF HEALTH
AUSTIN TEXAS
INTER-OFFICE

FROM George R. Anderson, M.D. TO Robert Bernstein, M.D., F.A.C.P.

SUBJECT TEXAS VETERANS AGENT ORANGE ASSISTANCE PROGRAM
STATUS REPORT FOR 2 MONTH PERIOD ENDING JULY 31, 1985

Received "Wisconsin Vietnam Veteran Mortality Study" for review

Ongoing communication with other state Agent Orange Commissions/Programs as their representative on the VA Advisory Committee on Health-Related Effects of Herbicides.

One summer employee is assisting with coding and data entry for the Epidemiological Study. A senior citizen volunteer is also assisting the program on a limited basis.

MAJOR ACCOMPLISHMENTS

1. Number of veterans in the program has increased to 1,962-- an increase of 1,565 since the beginning of FY 84.

2. To date 1,243 cases have been reviewed by the Subject Selection Committee, of which over 248 have been selected for referral to the University of Texas clinical studies. A total of 906 blood/sperm specimens have been collected and shipped to the University of Texas System laboratories and one fat tissue shipped for analysis in the V.A./E.P.A. Study of Dioxin Levels in Human Adipose Tissue.

MEETINGS ATTENDED

None attended or scheduled.

Attachment--Data Sheet

cc: Agent Orange Selection Committee
Agent Orange Advisory Committee
Veterans' Organizations and other
interested individuals

SIGNED George R Anderson M.D.

DATE August 2, 1985

FORM NO. AG-2-A

TEXAS VETERANS AGENT ORANGE ASSISTANCE PROGRAM
TEXAS DEPARTMENT OF HEALTH
DATA SHEET
(as of July 31, 1985)

NOTE: Variation in totals is due to receipt of only questionnaires to date and/or lack of medical/military information.

In some instances, the initial complaint and those listed under "Other Medical Problems" were supplied by the veteran rather than a physician.

BY AGE	(When entering program)
29	2
30	7
31	27
32	41
33	74
34	117
35	134
36	169
37	120
38	97
39	72
40	56
41	31
42	36
43	20
44	30
45	25
46	17
47	17
48	16
49	20
50	20
51	23
52	20
53	20
54	15
55	9
56	11
57	7
58	9
59	8
60	3
61	1
62	5
63	1
64	1
65	2
66	3
68	1
70	1
72	1

BY SEX

MALE	1958
FEMALE	4

BY RACE

WHITE	733
BLACK	244
HISPANIC	277
OTHER	9

NO. OF DECEASED VETERANS REPORTED INTO THE PROGRAM	22
NO. REPORTED INTO THE PROGRAM AND DETERMINED NOT TO BE ELIGIBLE	18
NO. REPORTED INTO THE PROGRAM AND RESIDING IN ANOTHER STATE	26

BY SERVICE

Army	791
Air Force	118
Marines	193
Navy	57

TEXAS VETERANS AGENT ORANGE ASSISTANCE PROGRAM
TEXAS DEPARTMENT OF HEALTH, AUSTIN, TEXAS

DATA SHEET (as of July 31, 1985)

BY COUNTY

Anderson	5	Goliad	2	Milam	2
Andrews	1	Grayson	11	Montague	1
Angelina	1	Gregg	3	Montgomery	8
Aransas	3	Guadalupe	2	Moore	1
Bandera	3	Hale	1	Morris	1
Bastrop	4	Hamilton	1	Nacogdoches	1
Bee	3	Hardeman	1	Navarro	2
Bell	50	Hardin	2	Newton	4
Bexar	101	Harris	118	Nueces	53
Bosque	3	Harrison	3	Ochiltree	1
Bowie	9	Haskell	1	Orange	9
Brazoria	12	Hays	2	Palo Pinto	1
Brazos	8	Henderson	2	Parker	3
Brooks	1	Hidalgo	26	Parmer	1
Brown	1	Hill	2	Potter	10
Burleson	3	Hockley	1	Randall	5
Burnet	5	Hood	2	Reeves	1
Calhoun	2	Hopkins	2	Richmond	1
Callahan	2	Howard	4	Robertson	1
Cameron	13	Hunt	6	Rusk	3
Cass	5	Hutchinson	1	San Jacinto	2
Castro	2	Jackson	1	San Patricio	12
Chambers	1	Jasper	1	Shelby	1
Cherokee	5	Jefferson	15	Smith	6
Collin	7	Jim Wells	5	Starr	1
Collingworth	2	Johnson	5	Tarrant	71
Comal	3	Karnes	1	Taylor	3
Concho	1	Kaufman	7	Tom Green	5
Cooke	4	Kendall	2	Travis	82
Coryell	10	Kerr	5	Tyler	1
Crockett	1	Kimble	1	Upshur	6
Dallas	104	Kleberg	3	Uvalde	3
Deaf Smith	1	Lamar	2	Val Verde	6
Denton	6	Lamb	1	Van Zandt	4
Dewitt	1	Lampasas	3	Victoria	7
Dimmit	1	Lavaca	3	Walker	38
Donley	2	Leon	1	Ward	4
Duval	1	Liberty	6	Webb	6
Ector	6	Llano	2	Wharton	1
Ellis	3	Lubbock	12	Wichita	11
El Paso	109	Lynn	1	Wilbarger	1
Falls	3	Marion	2	Willacy	1
Fannin	2	Matagorda	2	Williamson	14
Fayette	2	Maverick	1	Wilson	2
Fisher	1	McCullock	1	Winkler	1
Fort Bend	7	McLennan	9	Wise	5
Gaines	2	Medina	2	Wood	2
Galveston	21	Midland	6	Young	1
				Zapata	1

TEXAS VETERANS AGENT ORANGE ASSISTANCE PROGRAM
TEXAS DEPARTMENT OF HEALTH, AUSTIN, TEXAS

DATA SHEET (as of July 31, 1985)

DUTY PERFORMED	
Accounting Specialist	1
Administrative Specialist	10
Administrative & Supply	5
ADP Officer	1
Aerial Photo Interpretator	2
Airborne Infantry	3
Aircraft Technician	42
Air Crew	71
Air Frame Repair Specialist	1
Air Mobile	2
Air Policeman	1
Air Operation Supervisor/Spec.	1
Air Traffic Control	2
Ammunition	6
Ammo Cargo Handler	2
Armor Unit	12
Artillery	62
Base Maintenance	1
Battalion Clerk	2
Boatswain Mate	5
Calibration Team Technician	1
Career Counselor	2
Cargo Handler	6
Carpenter	3
Chaplain	3
Chemical Operations	11
Combat Cook	20
Combat Engineer	22
Combat Military Police	1
Combat News Correspondent	1
Communications Specialist	30
Construction	10
Controller	1
Convoy Escort	4
Corpsman	7
Counterinsurgency Specialist	1
Courier	1
Coxswain	1
Crane Operator	1
Crew Chief	5
Deck Force	2
Demolition Expert	3
Dining Facility Manager	2
Engineering	15
Equipment Repair	4
Explosives	2
Finance	3
Firefighter	2

DUTY PERFORMED	
Food Service	6
Forward Air Control	2
Freight Handler	1
Grave Registration	4
Ground Crew	6
Guard	1
Gunfire Spotter	1
Gunner's Mate	7
Harbor Defense	1
Infantry	456
Inspector General	1
Intelligence	18
Interrogator	2
Investigator, Narcotic	1
Journalist	1
Lineman	4
Machinist	1
Maintenance	20
Mechanic	32
Medic	24
Medical Advisor	4
Medical Clerk	1
Medical Corps	2
Mess Steward	1
Meteorologist	1
Military Advisor	2
Military Police	17
Musician	1
NCO	1
Neuropsy Specialist	1
Nurse	3
Operator, Heavy Equipment	11
Paratrooper	3
Personnel Officer	4
Petroleum Storage Supply	4
Photographer	2
Pilot	16
Platoon Leader	6
Plumber	3
Polelineman	1
Powerlineman	2
Printer Guard	1
Psychological Operations	3
Radar Operator	4
Radio Operator	9
Radio Repair (field)	3
Recon. Infantry	5
Recon. Forward Observer	11
River Rat	3

TEXAS VETERANS AGENT ORANGE ASSISTANCE PROGRAM
TEXAS DEPARTMENT OF HEALTH, AUSTIN, TEXAS

DUTY PERFORMED

Sea Bees	3
Security Guard	5
Sergeant/Clerk	2
Ship Crew	2
Ship Engine Man	1
Signal Corps	9
Small Missile Repairman	1
Social Worker Physical Specialist	1
Special Forces Advisory Group	6
Supply Sergeant	21
Supply Specialist	36
Support Battalion	11
Switchboard Operator	1
Tank Crewman	9
Telephone Repair	2
Translator/Interpreter	1
Transportation	23
Truck Driver	33
Tunnel Rat	1
Warehouseman	4
Watercraft Operator	1
Weapons Mechanic	2
Wireman	5

NO OF VETERANS REPORTING MISCARRIAGES/STILLBIRTHS 329

NO OF VETERANS REPORTING CHILDREN WITH BIRTH DEFECTS AND/OR MEDICAL PROBLEMS PRESENT SINCE BIRTH 307

TEXAS VETERANS AGENT ORANGE ASSISTANCE PROGRAM
TEXAS DEPARTMENT OF HEALTH, AUSTIN, TEXAS

DATA SHEET (as of July 31, 1985)

CURRENT OCCUPATION	
Accountant	11
Active Duty	3
Administrative	34
Aircraft	13
Air Conditioning/Refrig. Contractor	4
Apartment Manager	2
Applied Research Lab	1
Army Depot	4
Attorney	3
Automotive	1
Banking	2
Barber	3
Bellman	1
Biomedical Engineering Technician	2
Border Patrol	1
Building Inspector	1
Cable Company	4
Carpenter	18
Carpet Installer	1
Cement Company	1
Chemical Company	6
Child Care	2
Chrome Plater	1
City Employee	8
Civil Service	8
Clergy	3
Clerical	8
Computers	6
Construction	28
Consultant	5
Cook	5
Correctional Institution	1
Counselor	2
Cowboy	2
Custodian	11
Disability Examiner	1
Disabled, medically unemployed	96
Draftsman	3
Editor, publication	1
Education Specialist	1
Electrical Supply	1
Electrician	14
Electrician, Naval Aviation	1

CURRENT OCCUPATION	
Electric Technician	3
Electronics Technician	14
Employment Interviewer	1
Engineering	6
Environmentalist	1
Equipment Operator	15
Executive	3
Executive, Oil Field	1
Fence Builder	1
Firebrick Company	1
Fire Dept.	9
Fisherman	2
Floor Finisher	1
Food Service	7
Funeral Home	2
Furniture Restoration	1
Gas pipeline operator	1
Glazier	2
Grocer	1
Hair Stylist	1
Helicopter Technician	1
Highway Dept.	1
Inmate	46
Inspector Quality Control	2
Insurance Claims/Agent	8
Investigator, State	5
Ironworker	4
IRS	1
Laborer	14
Laundry	2
Lawman	27
Legal Assistant	1
Library	1
Lineman	4
Lumber Mill Worker	2
Machinist	18
Maintenance	19
Management Analyst	1
Meat Packer	1
Mechanic	52
Medical Assistant	1
Medical Lab Tech.	1
Military Base	1
Millwright	3
Mobile Court Owner	1
Musician	1
Newspaper Carrier	1
Nurse	2

TEXAS VETERANS AGENT ORANGE ASSISTANCE PROGRAM
TEXAS DEPARTMENT OF HEALTH, AUSTIN, TEXAS

DATA SHEET (as of July 31, 1985)

CURRENT OCCUPATION	
Nursing Assistant	1
Offshore Oil	3
Oilfield	12
Operating Room Technician	1
Optometry	1
Oxygen Plant	1
Painter	4
Parks Service	1
Pest Control	1
Pharmacy Tech.	3
Photographer	2
Physical Therapist	1
Physician	3
Pipefitter	5
Planner Estimator	1
Plant Operator	4
Plumber	12
Porter	1
Post Office	53
Printer	5
Private Investigator	2
Probation Officer	3
Production	1
Psychologist	1
Purchasing	1
Railroad	13
Ranching/Farming	4
Real Estate	3
Recruiter (service)	1
Refinery/Boilermaker	5
Rehabilitation Center	5
Repair electrical equipment	1
Retired	24
Sales	48
Sanitarian	1
Sawmill Operation	1
Seaman	1
Security	24
Self-Employed	11
Service Station	2
Shipping Clerk	5
Shrimper	1
Silver Smith	1
Slaughterhouse	1
Speech Therapist	1
State Employee	1
Steel Company	7
Stocker	1

CURRENT OCCUPATION	
Store Manager	5
Student	14
Supervisor, Computer	4
Supervisor, Production	9
Supply Clerk	1
Teacher	18
Telephone Company	7
Tool & Dye	1
Tree Surgeon	1
Typewriter Repair	1
Unemployed	110
Upholsterer	2
Utility Company	6
Vehicle Driver	63
Warehouseman	13
Welder	26
Woodworker	4
Writer	1

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INITIAL COMPLAINT (as reported by the veteran)

Abdominal Pain	3	Itching	17	Tingling in extremities	42
Acne	17	Joint pain	28	Tumors, skin	5
Allergies	6	Kidney	10	Vomiting blood	5
Anxiety	12	Lesions	10	Ulcer	8
Apnea (shortness of breath)	10	Lethargy	3	Urination frequency	5
Arthritis	8	Liver damage	17	Visual disturbance	11
Asphyxia	1	Liver pain	4	Weight loss/gain	5
Asthenia (weakness)	9	Loss of appetite	2	Withdrawal regression	1
Atrophy	1	Low potassium level	2		
Back Pain	6	Low resistance to disease	3		
Birth Defect, child	37	Lumps on body	21		
Blackouts	2	Lumps in scrotum	1		
Blood Disorders	10	Lung disease	4		
Body Aches	4	Memory impairment	8		
Cancer	62	Miscarriage	7		
Chest Pain	15	Multiple sclerosis	3		
Chloracne	10	Muscle spasms	7		
Confusion	1	Nausea	2		
Constipation	2	Nerve problems	100		
Cysts	9	Neuralgia (nerve pain)	1		
Depression	17	Numbness	123		
Diabetes	1	Paralysis, extremities	4		
Diarrhea	9	Personality change	2		
Dizziness	13	Pneumothorax	1		
Dysphasia (speech impairment)	1	Pruritus, intense (itching)	1		
Dyspnea (labored breathing)	4	Rages	2		
Edema	11	Rash	524		
Emotional Problems	52	Rectal bleeding	5		
Epilepsy	1	Renal failure, chronic	1		
Fatigue	10	Respiratory problems	5		
Fever, recurring	5	Reversed sperm travel	1		
Gastritis, chronic	1	Seizures	5		
Gastrointestinal disorders	84	Sensorial impairments	1		
Hair Loss	7	Sexual problems	35		
Headaches	107	Skin infection	13		
Heart murmur	1	Skin blistering/peeling	36		
Hematoma	1	Skin pigmentation, loss of	10		
Hepatitis, recurrent	2	Sleeplessness	55		
Hepatomegalia	1	Sores/boils	18		
Hives	2	Sore throat, chronic	3		
Hyperlipidemia	1	Sperm count--low	4		
Hypertension	24	Stroke	1		
Infected prostate	2	Sunlight allergy	2		
Infections	11	Tendenitis	1		

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DIAGNOSIS (Dx)--as reported by physician

Aberrant innervation of third cranial nerve (child)	1
Acalculous choleystitis	1
Acne	10
Acne keloidalis nuchae	1
Acrocyanosis	1
Acrokeratosis verrucofomis	1
Actonic keratoses	1
Adenoma, villous	1
Agent orange symptomatology	2
Alcoholism	15
Allergic rhinitis	2
Alopecia areata	3
Amebic liver abscess	1
Amputation, fingers, congential (child)	1
Anemia	4
Ankylosis spondylitis	2
Anxiety, chronic	17
Anxiety neurosis	11
Aortic insufficiency	1
Apnea (cessation of breath)	5
Arteriosclerosis, advanced (carotids & femorals)	2
Arthralgias (joint pain)	12
Arthritis	16
Arthritis, cervical	5
Arthritis, degenerative	12
Arthritis, gouty	5
Arthritis, poly, seronegative	1
Arthritis, post-traumatic	3
Arthritis, rheumatoid	2
Arthritic changes of joints	1
Aspermia	1
Asthma	1
Atherosclerotic occlusive peripheral vascular disease	1
Atrophy of kidney	1
Azoospermia	3
Baker's cyst	1
Barlow's syndrome	1
Bell's palsy	1
Bilateral acanthosis	1
Bilateral internal tibial torsion (child)	2
Bilateral metatarus adductus (child)	1
Bilateral mandibular tori	1
Bilaterial calycealcaluli	1
Bilateral supernumerary fingers, non-boney (child)	1
Bipolar disorder	1
Bowen's disease	1
Brain syndrome, chronic	1
Bronchitis, chronic	8
Bullous emphysema	1
Buerger's disease	2
Bursitis	3
Calcaneovarus deformity of feet (child)	1
Cancer (Neoplasm)-total 74	
Adenocarcinoma of esophagus	1
Adenocarcinoma of rectum stage Dukes C w/ 5/15 lymph nodes positive for Ca	1
Adenocarcinoma of rectum, Duke C	1
Adenocarcinoma of rectum w/seeding of pararectal fat	1
Adenocarcinoma of sigmoid colon	1
Adenocarcinoma of sigmoid colon with metastasis	4
Basal cell	8
Bladder, low grade	1
Bronchogenic carcinoma, squamous cell	1
Carcincoma of esophagus	1
Carcinoma of rectum w/metastasis to liver	1
Differentiated lymphocytic lymphoma, nodular type, Stage 4 w/widespread metastasis	1
Diffuse bilateral adenocarcinoma w/metastases multiple areas bone/brain	1
Embryonal cell carcinoma, Stage 1 w/teratoma, left testicle	1
Epidermoid carcinoma of esophagus	1
Esophagus	2
Fibrohistiocytoma (leg)	1
Giant cell tumor of bone	1
Glioblastoma multiforme, brain	1
Hodgkin's disease	2
Larynx	2
Malignant melanoma	3
Metastatic carcinoma in hilar lymph node	1
Metastatic embryonal cell carcinoma (testis)	1

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DIAGNOSIS (Dx)--as reported by physician

Metastatic malignant melanoma, bowel and subcutaneous tissue/ renal cell carcinoma, left kidney	1
Metastatic melanoma lesion, right parieto-occipital	1
Metastatic squamous carcinoma to scalene node	1
Mixoid liposarcoma w/chest & spine metastasis	1
Myeloma, multiple	1
Nasopharyngeal carcinoma	1
Neoplasm, malignant (transitional cell carcinoma) kidney	1
Oat cell Ca of lung w/liver & bone metastasis	1
Papillary (transitional cell carcinoma, Grade I) of bladder	1
Pituitary adenoma (brain) chromophobe type w/hypopituitarism	1
Plasmacytoma ilium, recurrent	1
Renal cell carcinoma	3
Right apiccal, large cell Ca w/ resultant Horner's syndrome	1
Right breast	1
Sarcoma, left leg	1
Seminoma, right testis	4
Squamous cell carcinoma of ear (epidermoid carcinoma)	1
Squamous cell of lung	4
Squamous cell carcinoma of anus, keratinizing	1
Squamous cell carcinoma of larynx, keratinizing, Grade I, invasive	1
Squamous cell carcinoma of pinna of ear	1
Testicular	3
Transitional cell carcinoma of bladder, Grade III	2
Undifferentiated liver carcinoma	1
Capillary hemangioma	1
Cardiomegaly	1
Carpal tunnel syndrome	3
Cataplexy	1
Cephalhematoma of foot postional deformity (child)	1
Cerebellar atrophy	2
Cerebellar tumor (child)	1
Cerebello insufficiency	1
Cerebral convulsive disorder	1
Cerebral palsy (child)	3
Cervical adenopathy	2
Charcot-Marie-Tooth	1
Chest pain syndrome	1
Chloracne	5
Cholecystitis, chronic	2
Chondromalacia, patella	2
Chronic infection and subcutaneous papular eruption	1
Chronic sclerosing glomerulonephritis	1
Cirrhosis of liver	4
Cleft palate (child)	2
Club-Foot (child)	2
Coagulopathy	1
Colitis	4
Collagen disorder	1
Colon, mass in	1
Colon, spastic	1
Congential absence of tibia (child)	1
Congenital athyriotic hypothyroidism (child)	1
Congential dislocation of hip (child)	1
Congenital heart disease, pulmonary valve artresia (child)	1
Congenital polyneuropathy (child)	2
Condyloma accuminata	1
Congestive heart failure	1
Constipation	2
Convergence insufficiency by Hx	1
Conversion reaction (numbness)	1
Coronary Artery Disease S/P/	1
Coronary atherosclerosis	1
Costochondritis	3
Crohn's disease	1
Crouzon's disease (child)	1
Cyst, sebaceous	6
Cyst, vocal cord	1
Degenerated nucleus pulposus	1
Degenerative changes in joint	5
Demorphic erythrocytosis	1
Demyelination of peripheral nerves	1
Depression atypical	2
Depression w/anxiety	24
Depression, endogenous	2

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DIAGNOSIS (Dx)--as reported by physician

Depression syndrome, chronic	3
Depressive disorder	3
Depressive neurosis	4
Dermatitis, atopic	5
Dermatitis, chronic	14
Dermatitis, contact	6
Dermatitis, erythematous	3
Dermatitis, perineal	1
Dermatitis, photosensitivity	2
Dermatitis, pruritis	3
Dermatitis, scaly	1
Dermatitis, seborrheic	11
Dermatofibromas	6
Dermatophytosis, recurrent	3
Diabetes	4
Diabetes mellitus	17
Diastematomyelia (child)	1
Dumping syndrome	1
Duodenitis	1
Dysethesias, diffuse	1
Dyshidrosis (disorder of sweat glands)	4
Dysmethic disorder	6
Dysphasia	1
Dyspnea	3
Ecchymosis of legs	1
Ecthyma	2
Eczema	12
Eczema, atopic	4
Eczema, seborrheic	2
Eczematous lesions	5
Emphysema	4
Encephalopathy	2
End stage renal disease	1
Eosinophilia	1
Ependymoma, cerebellar (child)	1
Epididymitis	7
Epilepsy, idiopathic	1
Epilepsy (child)	3
Epistaxis, recurrent (child)	1
Erythema multiforma	2
Erythematous macular	4
Erythematous papular	1
Erythematous, resolving	2
Esophagitis	1
Esophoria (child)	1
Exfoliative erythroderma	1
Extrarenal Wilms tumor (child)	1
Fatigue	1
Fatty Metamorphosis	1
Feet turned inward (child)	1
Fibroepithelial papilloma	1
Fibromas	1
Fibromyalgia	1
Fibromyositis syndrome	1
Fibrosis	1
Folliculitis	15
Forefoot Adductus (child)	1
Fundoplasty	1
Furunculosis (boils)	3
Gastritis, chronic	12
Gastroenteritis	2
Gastroesophageal reflux	2
Globus hepterious	1
Glomerulonephritis	4
Granulatoma, Rt. scrotum	1
Granuloma	1
Granuloma Annulase	1
Granulomatous colitis	1
Granulomatous pulmonary disease	1
Granulomatous skin lesions	1
Granulomatous ulcer	1
Guillain Barre Syndrome	3
Gynecomastia, breast	3
Headaches	16
Headaches, cluster	1
Headaches, vascular	12
Hematoma	1
Hematuria	5
Hemoptysis, chronic	2
Hemorrhoids	18
Hemorrhaphies, bilateral inguinal	2
Hepatitis, infectious	4
Hepatocellular degeneration, focal	1
Hepatocellular dysfunction	1
Hepatomegaly	2
Hernia	2
Hernia, hiatal	8
Hernia, inguinal	7
Hernia, inguinal indirect (child)	1
Herpes simplex	1
Herpes zoster	2
Hidrosadenitis, chronic, supprative (inflammation of sweat glands)	2

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DIAGNOSIS (Dx)--as reported by physician

Hilar adenopathy w/calcification	1
Hyaline membrane disease (child)	2
Hydrocele	1
Hydrocephalus (child)	2
Hygroma, cystic (child)	1
Hyperanxiety	1
Hyperbilirubinemia	1
Hypercalciuria	1
Hypercholesterum	1
Hyperlipidemia	3
Hyperpigmental scaly plaques	3
Hyperpigmentation	1
Hypersomnia	2
Hypertension	59
Hyperthesia, extremities	2
Hyperlipemia	1
Hyperlipoproteinemia (Type IV)	1
Hyperthyroidism (child 1)	4
Hypertryglycerdemia (Type IV)	2
Hyperuricemia	4
Hypochondriasis	1
Hypoglycemia	5
Hypopigmented areas (face)	1
Hypoplastic breast (child)	1
Hypospadias (child)	1
Hypotension	3
Hypotonia (child)	1
Hysteronic personality	1
Infection, persistent, soft tissue (child)	1
Infundible pulmonary stenosis (child)	1
Iritis, chronic	1
Joint disease, degenerative (of back)	2
Joint pain, peripheral	1
Keratitis	1
Keratoderma	1
Left spastic hemiparesis	1
Leukemia, acute, lymphocytic (child)	2
Leukemia, myelogenous, chronic	2
Leukocytosis w/atypical lymphocytos	1
Lichen planus	3
Lichen simplex chronicus	3
Lipoma	13
Lipoma, cyst in lumbar area	1
Lipoma, spermatic cord	2
Liver pain	1
Lumber sprain	1
Lung disease, severe, chronic, obstructive	1
Lupus, discoid	1
Lupus erythematosis	3
Lymphodenitis, chronic	1
Lymphoid hyperplasia	1
Lymphopranuloma inguinale	1
Macular melasna	1
Maculo-erythematous (rash)	2
Mastoiditis, chronic sclerosing	1
Meniere's disease	1
Meningitis, cryptococcus	2
Meningomyelocele (child)	1
Mental Retardation (child)	1
Metatarsus adductus (w/medial tibial torsion) (child)	2
Microtia of ear (child)	2
Microcephaly (child)	1
Missing pectoralis (left) major muscle (child)	1
Multiple sclerosis	1
Musculoskeletal condition	1
Myelomeningocele, lumbrosral (child)	1
Myocardial infarction, acute	2
Myofacial pain	1
Narcolepsy	1
Nephrolithiasis	1
Neuralgias	2
Neuralgia w/headache and recurrent fever	1
Neurasthenia	1
Neuritis	1
Neurodermatitis	8
Neuroma	1
Neurosis, depressive	3
Numbness in extremities	14
Numbness ulnar aspect upper extremities	1
Oligohydramnias (child)	1
Oligospermia	2
Onchomycosis	5
Organic brain syndrome	2
Osgood-Schlatter's disease (knee)	1
Osler-Weber-Rondu disease	1
Osteoarthritis, cervical	2

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DIAGNOSIS-(Dx)--as reported by physician

Osteoarthritis, degenerative	4
Osteoarthrosis, degenerative	1
Osteomylitis	1
Pancreatitis, hyperlipidemia, chronic	1
Papilloma	2
Papular squamous rash	2
Paralysis of vocal chords	1
Paranoid schizophrenia disorder	3
Paranoid state	1
Parapsoriasis	1
Parasthesias of extremities	3
Paroxysmal atrial tachycardia	1
Patent ductus arteriosus (child)	2
Patent ductus arterosis of formen ovale cordus (child)	1
Peptic esophagitis	1
Peroneal palsy	1
Peripheral neuropathy	5
Peripheral ulnar palsy	1
Personality disorder	14
Peyronie's disease	2
Photosensitivity	1
Pityriasis alba	1
Pityriasis rubra pilaris	2
Pityriasis versicolor	1
Plantar, hyperkeratosis, mild	1
Pleural scarring	1
Pneumothorax	4
Pneumothorax, spontaneous	5
Polyarthralgia	2
Polyneuropathies	1
Polyps, nasal/vocal cords	4
Porphyria	1
Porphyria cutanea tarda	3
Posterior cervical pain	1
Post traumatic stress syndrome	71
Premature ejaculation	1
Proctitis, inflammatory	2
Prostatitis, chronic	16
Proteinuria	1
Pruritis	13
Pruritus/onychomycosis of extremities	1
Pseudofolliculitis	3
Psoriasiform lichen simplex chronicus	1
Psoriasis	13
Psychosis, major	1
Psychotic depressive reaction (child 1)	3
Pulmonary atresia	1
Pulmonary disease, chronic obstructive	2
Pulmonary emboli, massive	1
Pulmonary embolism, ASC VC CVI	1
Pulmonary nodule	1
Pustules, recurrent	2
Pyelonephritis	1
Pylorospasm	1
Radicular neuropathy	1
Rash	7
Rash, maculopapular	1
Raynaud's phenomenon	2
Reiter's disease	1
Renal glycasuria (no diabetes)	1
Rhinitis	3
Sarcoidosis	4
Schizoid disorder	5
Schizophrenia	19
Schizophrenia, chronic, undifferentiated type	11
Schizophrenia, paranoid	31
Schizophrenia, schizo-affective type	3
Schizo-type disorder	4
Sciatica	1
Scleroderma	1
Scoliosis (child)	1
Sebaceous cyst abscess	4
Seborrhea	12
Seizure disorder	4
Soto's Syndrome (child) (cerebral gigantism)	1
Spermatocelectomy	1
Spermatoceles	3
Sperm count, low	3
Spina bifida (child)	4
Spondylolisthesis	5
Spondylosis	3
Stenosis of larynx	1
Sterility	5
Stress syndrome	1
Supple pes planus (child)	1
Syncopy	1
Syndactyly index w/absence and congenital absence of middle phalanx of 4 fingers (child)	1

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DIAGNOSIS (Dx)--as reported by physician

Tardive dyskinesia	1
Telangiectasia	1
Tendinitis	1
Tenosynovitis (De Quervain's Disease)	1
Testicular mass	1
Testis, atrophic (child)	2
Thrombocytopenia	1
Tibial torsion of leg (child)	5
Tietze's syndrome	1
Tinea corpis	12
Tinea cruris	26
Tinea cruris pedis w/ onychomycosis	4
Tinea pedis	12
Tinea versicolor	21
Tonsillitis, acute, chronic	1
Transurethral resection	1
Trichophytosis	3
Tricuspid atresia, atrial septal defect, ventricular septal defect (child)	1
Triglycerides, high	3
Tropical fungus	1
Truncal dystonia	1
Ulcer, duodenal	15
Ulcer, peptic	12
Uroporphyria	1
Urticaria, giant, recurrent	1
Varicocele	1
Xerosis of skin (dryness)	3

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CANCER IN VETS AGE 36 AND UNDER (substantiated by medical records)

Case #	Age When Dx	Type of Cancer/ICD No.
#13	30	Metastatic malignant melanoma 172.9 M8720/6
#15	30	Squamous cell Ca w/adenocarcinomatous components, rt. lung 162.9 M8070/3
#40	31	Basal cell Ca 173.9 M8090/3
#54	31	Ca of esophagus 150.9 M8010/3
#98	35	Polypoid carcinoma of sigmoid colon 153.9 M8050/3
(#106	33	Renal cell carcinoma, left kidney (died at age 33) 189.0 M8312/3
(#106	33	Metastatic malignant melanoma, bowel & subcutaneous tissue (died at age 33) 172.9 M8720/6
#107	29	Multiple melanomas, Stage I (died at age 31) 172.9 M8720/3
#121 *	31	Diffuse bilateral adenocarcinoma w/metastasis multiple areas bone/brain (died at age 31) 170.9 M8140/6
#151	33	Ca of esophagus (died at age 34) 150.9 M8010/3
#180 *	36	Ca of larynx 161.7 M8010/3
#242	36	Giant Cell tumor of bone 170.9 M9250/3
#315	30	Metastatic embryonal cell carcinoma (testis) with pulmonary involvement (died at age 30) 186.9 M9070/6
(#316	30	Basal cell carcinoma 173.9 M8090/3
(#316	33	Seminoma of right testis 186.9 M9061/3
#469 *	36	Squamous cell carcinoma of anus, keratinizing 154.3 M8071/3
#474	34	Seminoma, testis 186.9 M9061/3
#523 *	34	Malignant melanoma 172.9 M8720/3
#551	25	Pituitary adenoma (brain) chromophobe type w/ hypopitutarism 237.0 M8270/0
#603 *	23	Basal cell epitheliomas, nose 173.3 M8090/3
#621 *	25	Seminoma, right testicle 186.9 M9061/3
#631 *	32	Sertoli cell carcinoma, testis 186.9 M8640/3
#676 *	36	Seminona, right testis 186.9 M9061/3
#1072 *	35	Nasopharyngeal carcinoma 147.9 M8010/3
#1213 *	28	Renal cell carcinoma 189.0 M8312/3
(#1259	36	Sarcoma, left leg 170.7 M8800/3
(#1259	38	Osteosarcoma left leg w/metastasis right lung 170.7 M9180/6
(#1672	35	Malignant melanoma (Level III)
(#1672	42	w/cerebral metastasis 172.9 M8720/6
#1684 *	32	Renal cell Ca. 189.0 M8312/3
#1732	30	Plasmacytoma right ilium, recurrent 203.8 M9731/3
#1751 *	36	Undifferentiated liver carcinoma 155.2 M8020/3
#1900	35	Myxoid liposarcoma w/spine & chest metastasis 171.9 M8852/6

* Veterans who have sought treatment at a Veterans Administration Medical facility for their malignancies.

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CANCER IN VETS OVER AGE 36 (substantiated by medical records)

Case #	Age When Dx	Type of Cancer/ICD No.
#16	51	Renal cell Ca left kidney 189.0 M8312/3
#24 *	47	IGA, Multiple myeloma-lumbar spine (died at age 50) 170.2 M9730/3
#30	53	Ca of lungs, squamous cell 162.9 M8070/3
#70 *	44	Transitional cell Ca, Grade I 188.9 M8120/3
#76	40	Ca breast w/metastasis to axilla 175.0 M8010/6
#146 *	41	Basal cell Ca of nose 173.3 M8090/3
#214	48	Squamous cell Ca anterior fascialpillar 146.2 M8070/3
#239	48	Neoplasm, malignant (transitional cell carcinoma) right kidney 189.0 M8120/3
#249	53	Glioblastoma multiforme, brain (died at age 53) 191.9 M9440/3
#295	52	Squamous cell carcinoma of larynx, keratinizing, Grade I, invasive 161.9 M8070/3
#304 *	41	Adenocarcinoma of lung w/brain metastases 162.9 M8140/6
#360 *	58	Adenocarcinoma of sigmoid colon metastasized to liver 153.9 M8140/6
#535	39	Basal cell Ca on scalp 173.9 M8090/3
#567 *	46	Testicular cancer 186.9 M8010/3
#622 *	50	Bronchogenic carcinoma, squamous cell, poorly differentiated; metastatic carcinoma in hilar lymph node 162.9 M8010/6
#638	45	Fibrohistiocytoma, leg 170.7 M8831/3
#806 *	68	Carcinoma of rectum w/metastasis to liver 154.1 M8010/6
#829	46	Metastatic squamous carcinoma to scalene node 195.0 M8070/6
#890 *	47	Epidermoid carcinoma left lung 162.9 M8070/3
#894 *	46	Epidermoid carcinoma of esophagus 150.9 M8010/3
#1041 *	60	Adenocarcinoma of sigmoid colon and metastatic to 1 of 3 lymph nodes (Duke C) w/metastasis to liver 153.9 M8140/6
#1053	52	Right apical (lung) large cell Ca w/ resultant Horner's syndrome 162.9 M8012/3
#1089	50	Chronic myelogenous leukemia 205.1 M9863/3
(#1093 *	50	Basal cell epitheliomas 173.9 M8090/3
(#1093 *	56	Bronchogenic carcinoma, left lung 162.9 M8010/3
#1178 *	60	Adenocarcinoma of rectum, Duke C 154.1 M8140/3
#1182	44	Ca of bladder, low grade 188.9 M8010/3
#1421 *	52	Adenocarcinoma of sigmoid colon w/metastasis to liver and lymph nodes 153.9 M8140/6
#1477	41	Basal cell carcinoma, nose 173.3 M8090/3

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CANCER IN VETS OVER AGE 36 (substantiated by medical records)

Case #	Age When Dx	Type of Cancer/ICD No.
#1496	48	Adenocarcinoma of rectum stage DukesC w/ 5/15 lymphnodes positive for Ca 154.1 M8140/6
#1578 *	50	Adencarcinoma of rectum w/seeding of pararectal fat 154.1 M8140/6
#1582	48	Bladder - papillary, transitional cell, grade I 188.9 M8130/3
#1622	37	Adenocarcinoma of esophagus 150.9 M8140/3
#1741	44	Squamous cell Ca of pinna right ear (epidermoid carcinoma) 173.2 M8070/3
#1820	55	Transitional cell Ca og bladder, Stage II 188.9 M8120/3
#1830	37	Differentiated lymphocytic lymphoma nodular type, Stage 4 w/widespread metastasis 202.8 M9620/6
#1833	39	Oat cell Ca of lung w/liver & bone metastasis 162.9 M8042/6
#1881	65	Basal cell Ca 173.9 M8090/3

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QUESTIONABLE CANCERS (substantiated by medical records)

#45	24	Granuloma Rt. scrotum
#169	29	Lipoma cyst in lumbar area

CHILDREN WITH LEG DEFORMITIES (substantiated by medical records)

#25	Club-foot, secondary to spina bifida
#40	Feet turned inward
#68	Congenital absence of rt. tibia
#152	Cephalhematoma rt. foot positional deformity at birth
#188	Metatarsus adductus w/medial tibial torsion
#207	Congenital dislocation of hip
#296	Club-Foot/Forefoot Adductus
#330	Supple pes planus
#571	Bilateral internal tibial torsion
#582	Bilateral metatarsus adductus
#583	Metatarsus adductus, right foot
#770	Club-foot
#872	Short leg
#978	Tibial torsion, both legs
#1603	Calcaneovarus deformity of feet
#1622	Bilateral internal tibial torsion
#1754	Tibial torsion of left leg

CURRENT RASHES (substantiated by medical records)

No. of cases 62

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TINGLING/NUMBNESS IN EXTREMITIES (substantiated by medical records)

Case #	Year Dx
#14	1981
#22	1968
#37	1981
#41	1977
#85	1980
#119	1980/1981
#145	1981
#192	1978
#195	1981
#206	1981
#211	1982
#212	1982
#224	1980
#229	1964
#267	1980
#306	1982
#338	1979
#341	1978
#389	1981
#415	1982
#422	1972
#423	1981
#450	1982
#500	1981
#872	1983
#1315	1984
#1417	1981
#1758	1983
#1808	1975
#1858	1983

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MISCARRIAGE/STILLBIRTH (substantiated by medical records)

Case #	Year Dx
#36	1970
#38	1972 (2)
#41	1973 (2)
#44	?
#63	1980 (2)
#67	Between 1974-1981 (2)
#82	1971, 1975, 1978
#83	1974, 1977
#85	1974
#86	1979, 1980
#97	1980
#99	1974
#142	1976, 1978
#156	1976
#173	1972
#179	1970
#181	1971
#183	1978, 1980, 1981
#209	1975
#241	1979
#310	1971,1979
#323	1979
#328	1977
#331	1975
#386	1977, 1980
#494	1976
#568	1983
#571	1976
#591	1982, 1983
#608	1975, 1976
#647	1971
#653	1973
#688	1980
#699	1981, 1982
#722	?
#773	1974
#774	1978, 1979
#822	1973, 1974, 1978
#841	1972
#854	1982
#879	1982
#926	1981
#930	1970
#948	1977
#953	1974
#954	1978
#978	1971
#997	1981
#1019	1978, 1982
#1095	1975, 1976
#1275	1975
#1278	1976, 1977
#1283	1974
#1395	1972
#1421	1971, 1978
#1655	1979
#1677	1977
#1754	1983
#1780	1983
#1809	1980 & ?
#1821	1971
#1835	1968

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SCHIZOPHRENIA (substantiated by medical records)

Case #	Year Dx	Case #	Year Dx
#16	1971	#1183	1974
#34	1976	#1198	1982
#43	1980	#1200	1982
#47	1981	#1291	1980
#123	1978	#1303	1973
#125	1974	#1323	1983
#128	1981	#1336	1981
#139	?	#1549	1982
#144	1979	#1581	1968
#164	1977	#1625	1968
#190	1983	#1634	1977
#229	1982	#1645	1982
#232	1979	#1669	1969
#238	1982	#1678	?
#245	1982	#1708	1976
#248	1968	#1718	1983
#253	1976	#1748	1977
#256	1975	#1776	1978
#294	1970	#1874	?
#301	1971		
#364	1969		
#371	1970		
#378	1976		
#381	1976		
#397	1972		
#401	1971		
#405	1973		
#431	1971		
#449	1981		
#455	1971		
#463	1972		
#552	1972		
#564	1970		
#565	1969		
#571	1971		
#634	1977		
#635	1970		
#809	1967		
#838	1982		
#844	1981		
#872	1980		
#953	1981		
#967	1982		
#1017	1976		
#1080	1980		
#1084	1982		
#1107	1981		

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POST TRAUMATIC STRESS DISORDER (Substantiated by medical records)

Case #	Year Dx	Case #	Year Dx
#10	?	#1308	1981
#32	1981	#1325	1981
#50	1981	#1327	1981
#60	1982	#1475	1981
#78	1982	#1516	1982
#104	1982	#1541	1982
#128	1982	#1604	1981
#141	1982	#1613	1981
#173	1982	#1776	1981
#177	1982	#1936	?
#223	1982		
#229	1982		
#270	1982		
#278	1982		
#298	1982		
#310	1981		
#361	?		
#362	?		
#364	1982		
#365	1983		
#366	?		
#367	?		
#378	1982		
#388	1982		
#430	1983		
#446	1982		
#449	1981		
#456	1982		
#459	1983		
#489	1981		
#600	1980		
#603	1983		
#623	1983		
#663	1983		
#697	1980		
#775	1981		
#783	1982		
#784	1981		
#838	1981		
#842	1982		
#849	1982		
#872	1982		
#875	1981		
#920	1985		
#967	1982		
#971	1982		

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OTHER MEDICAL CONDITIONS (as reported by veterans and physicians)

Acne	19
Acne, cystic	2
Alcoholism	8
Allergic bronchitis	3
Allergies	19
Alopecia areata (spotty baldness)	1
Anemia, iron deficiency	5
Anorexia	3
Anxiety	23
Apnea (cessation of breath)	16
Arteriosclerosis	3
Arthralgia	1
Arthritis	34
Asthenia (weakness)	35
Asthma	10
Ataxia (lack of muscle coord)	7
Back pain	29
Birth defects/medical problems--child	43
Blackouts	15
Blisters	10
Blood disorders	214
Body cramps/aches	15
Boils	18
Bones, decaying	2
Burning sensation in back/extremities	8
Calcium loss	2
Cancer	44
Chest pains	43
Chloracne	23
Colitis	4
Comedones	1
Constipation	8
Cyst	22
Cyst, retention	2
Delayed healing by first intention	2
Dementia, in remission	1
Depression	86
Dermatitis	6
Diabetes	22
Diarrhea	28
Disruption of circadian rhythms	1
Dizziness	78
Drug addiction	1
Dumping syndrome	2
Dysmorphic erythrocytosis (unusual shape of blood cells)	1
Dyspnea (labored breathing)	11
Dysesthesias, diffuse	1
Ear fungus	1
Eczema	2
Edema	16
Emotional problems	502
Endocrine problems	1
Epilepsy	1
Fatigue	60
Fat tissue lumps	11
Fever, recurrent	9
Fungus	10
Gall bladder w/mass	1
Gastrointestinal disorders	650
Glands, swollen	4
Gout	7
Growths, skin	32
Hallucinations	3
Hair loss	27
HBsag-Carrier	1
Headaches	566
Hearing problems	29
Heart attack	7
Heart problems	20
Hematuria	2
Hemorrhoids	4
Hepatitis	6
Hepatomegalia	1
Herpes	3
Hirsutism (abnormal body hair growth)	1
Hives	2
Hyperlipidemia	1
Hypertension	80
Hypertension, essential	1
Hypoglycemia	1
Hysteria	1

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OTHER MEDICAL CONDITIONS (as reported by veterans and physicians)

Infections, chronic	20
Immuno suppression	3
Irritability	18
Itching	34
Joint pain	83
Kidney problems	24
Liver problems	161
Loss of appetite	11
Loss of concentration	10
Loss of smell	3
Loss of taste	2
Low blood sugar	3
Lung problems	30
Melanomas	5
Memory loss	69
Meningitis, cryptococal	1
Moles	6
Muscle problems	37
Myocardial infarction, acute inferolateral	1
Nails fall out	11
Nausea	24
Nerve problems	575
Neuritis, traumatic	1
Nose bleeds	1
Numbness	323
Pancreatitis, chronic	3
Paresthesias of distal arms/legs	3
Peripheral neuropathy	3
Peripheral tumescense (swollen extremities)	3
Personality change	11
Pleurisy, chronic	2
Polyps	1
Porphyria	3
Post traumatic stress disorder	6
Prostatitis	22
Psoriasis	1
Pulmonary embolisms, multiple	1
Pulmonary fibrosis	1
Rash	385
Rectal bleeding, history of	29
Renal cysts	1
Reproductive problems	90
Restricted blood flow	7
Rhinitis (nose inflammation)	2
Respiratory problems	25
Seizures	7
Sensitivity to change in heat/cold	6
Sex, pain during	1
Sexual dysfunction	268
Shingles	1
Sinus problems	24
Skin, dryness	23
Skin hyper/hypopigmentation	24
Sleep disturbance	338
Sores	12
Speech problems	1
Sterility	6
Sweating, excessive	5
Tachycardia	2
TB, subclinical	3
Teeth, loss of	3
Throat, sore, chronic	8
Thyroid problems	1
Tingling of extremities	163
Tinitus (ringing in ears)	22
Ulcer	37
Upper respiratory infections (URI)	3
Urinary infections	21
Vascular insufficiency	6
Venous thrombosis, deep	1
Vision, blurred	22
Vision, decreased	27
Vision, sensitivity to light	9
Vomiting	19
Warts	6
Weight loss/gain	43

SUMMARY

of

PILOT STUDY PROTOCOLS

for the

TEXAS VETERANS AGENT ORANGE PROGRAM

September 1984

Protocols for four pilot studies have been developed by faculty of the University of Texas for use in the Texas Veterans Agent Orange Program administered by the Texas Department of Health. They are:

1. Cytogenetic/Bleomycin Testing
2. Aryl,Hydrocarbon Hydroxylase (AHH) Assay
3. Immune Evalution of Veterans Exposed to Agent Orange
4. Uroporphyrin Testing

These protocols are described in the attached documents. These studies have special subject selection requirements. They also have limitations and pitfalls that should be recognized by everyone interested in the outcome.

SUBJECT SELECTION. Interpretation of data gathered by the proposed pilot studies will depend heavily on the criteria and care used in selecting study subjects. Three categories of age-matched study subjects are required: 1) Vietnam veterans (at high risk), 2) Vietnam veterans (at low risk), and 3) unexposed controls.

Vietnam Veterans (at high risk). The establishment of a reliable exposure index is critical and very problematical. It may well be impossible to estimate degree, duration, and route of exposure to Agent Orange in most Vietnam veterans. However, it should be possible to identify some Vietnam veterans whose contact with Agent Orange, as reflected in personal histories and verified in military records submitted to the Texas Department of Health, was substantial and prolonged. From among this group of individuals, participants in the pilot studies should be selected on the basis of a detailed personal interview and medical history that would exclude subjects whose present or previous occupation, habits, or lifestyle might introduce obvious confounding factors into the study.

Vietnam Veterans (at low risk). Veterans whose service records and personal histories indicate an improbable contact with Agent Orange or other herbicides. Obvious confounding factors would exclude these veterans the same as the "high risk". It would be safe to state that in assigning high or low risk that increasing probability of a difference prevails as the size of the total group increases and the number of veterans determined to be in the non-selected medium group increases.

Unexposed Controls. These individuals, selected to exclude confounding factors, will serve as the normal control group for the pilot studies. These individuals are matched for usual factors and may be civilians or non-Vietnam veterans.

LIMITATIONS AND PITFALLS. The limitations of the laboratory-based pilot studies should be clearly understood. Some of these limitations are:

1. Uncertainty regarding degree, duration, and route of exposure to Agent Orange in individual study subjects is a major limitation of these studies. Efforts to cope with this uncertainty are discussed under the topic of Subject Selection.
2. Since exposure of veterans to Agent Orange or other herbicides used in Vietnam occurred more than a decade ago, any evidence or consequences of that exposure may have diminished to such an extent that it is no longer detectable.
3. The tests to be performed in these pilot studies will not detect effects that are specifically attributable to Agent Orange or any other herbicide. Chromosome damage, enzyme abnormalities, and suppressed immune responsiveness can result from any number of causes, some well-known and others yet unrecognized. Because of this, it will not be possible to conclude that disorders detected in any given individual are due to Agent Orange. However, this is not to say that populations of matched veterans whose detailed military, occupational, medical, and personal histories suggest that they differ as groups only in their exposure to Agent Orange.
4. Individuals whose test results are positive cannot be offered therapeutic manipulation or corrective intervention. There is no known way of reversing chromosome damage.

5. Negative results from these tests would not be definitive. In other words, absence of overt chromosome damage in the study population would not mean that other, less easily recognized effects were absent.

COSTS. The University of Texas has made every effort to minimize the costs that cannot be absorbed for tests done on veterans in these studies. For each matched set of exposed and unexposed individuals, the Texas Department of Health will cover the unabsorbable costs of $380 for cytogenetic testing, $800 for aryl hydrocarbon hydroxylase assay, and $800 for immune evaluation and uroporphyrin testing.

REPORTS. These studies will proceed at different rates. Upon completion, the investigators responsible for each study will present their data and results to the Texas Department of Health and, in addition, will prepare and submit their findings for publication in the scientific literature. Interim progress reports will be provided according to a schedule to be decided by mutual agreement of the Texas Department of Health and the individual investigators.

CYTOGENETIC/BLEOMYCIN TESTING.

Peripheral blood samples are set up with the standard blood culture medium to stimulate lymphocytes to grow. Standard cytogenetic harvest method (Colcemid block for 1 hr., hypotonic solution treatment for 20 min., fix and air-dried) is used to prepare 48-hr and 72-hr culture samples. The slides are stained with Giemsa. Thus, each blood culture will have two harvest samples.

Whenever possible, 100 metaphases are analyzed from each harvest sample to record chromatid-type and chromosome-type aberrations, and the aberrations are finally converted into breaks per cell for comparison.

ARYL HYDROCARBON HYDROXYLASE (AHH) ASSAY.

The purpose of this study is to evaluate veterans for evidence of abnormalities in the levels, activity, or regulation of the cytochrome P-450 microsomal mono-oxygenase enzymes. Lymphocytes will be cultured from blood samples obtained from veterans and matched controls. The cultured lymphocytes will be assayed for levels of the enzyme aryl hydrocarbon hydroxylase both with and without a challenge by 3-methyl cholanthrene to induce the enzyme. Induction of the cytochrome P-450 associated enzymes is the most basic biological effect of TCDD, the toxic contaminant of Agent Orange.

IMMUNE EVALUATION/UROPORPHYRIN TESTING.

This study will examine various measured immune parameters of 1) Vietnam veterans from Texas who were at high risk for exposure to Agent Orange, 2) Vietnam veterans from Texas who were at low risk for exposure to Agent Orange and 3) matched veteran-controls who were not exposed to Agent Orange. In addition, urine specimens will be collected from these same groups and tests will be performed to measure levels of urinary porphyrins.

AGENT ORANGE ADVISORY COMMITTEE

to the

TEXAS DEPARTMENT OF HEALTH

Development and Preliminary Results of Pilot Clinical Studies

Report of the Chairman

Guy R. Newell, M.D.

Professor of Epidemiology and Chairman,

Department of Cancer Prevention

The University of Texas System Cancer Center

Monday, March 26, 1984

ACKNOWLEDGEMENTS

The principal investigators, their colleagues and I wish to first acknowledge William B. Neaves, Ph.D. of The University of Texas Health Science Center at Dallas who was the first chairman of The University of Texas System Agent Orange Program Committee. It was under his skillful, thoughtful, and statesman approach that the initial pilot studies were reviewed, selected and initiated.

We are all indebted to Ms. Harriet Franson, the Program Manager for the Texas Department of Health, who sees to our requests and to those of the veterans we are trying to assist with both speed and compassion.

I want to thank Paul K. Mills, M.S., M.P.H. of the Department of Cancer Prevention, UTSCC, who prepared the section describing the criteria/selection methodology and analysed the criteria used in review of the first 255 Vietnam veterans.

Without the unending wealth of first-hand knowledge of Vietnam and its environs provided by George R. Anderson, M.D., Director of the Texas Veterans Agent Orange Assistance Program, the task of estimating gross exposure of veterans would have been impossible.

Finally, the support given to this program by Robert Bernstein, M.D., F.A.C.P., Commissioner of the Texas Department of Health has been unyielding.

Background

During the Vietnam War, U.S. military personnel sprayed large quantities of a herbicide called "Agent Orange" over the Vietnamese countryside. The herbicide, named because of its shipment in orange-striped barrels, consisted of approximately equal portions of the n-butyl esters of 2,4-dichlorophenoxyacetic acid (2,4-D) and 2,4,5-trichlorophenoxyacetic acid (2,4,5-T). These shipments of Agent Orange were contaminated during the manufacturing process with traces of a highly toxic chemical, the dioxin 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD). Its concentration varied from batch to batch but averaged about 2 ppm of 2,4,5-T. TCDD is known to be an exceptionally toxic chemical.

Concerns have been frequently raised by Vietnam veterans that Agent Orange exposure may result in infertility, genetic damage, birth defects in offspring, and cancer. No studies to date have confirmed these suspicions. In 1981, the Texas Legislature established a program to assist veterans who may have been exposed to certain chemical defoliants or herbicides, including Agent Orange. An important goal of the Texas Veterans Agent Orange Assistance Program was to determine if veterans have suffered physical damage as a result of substantial exposure to Agent Orange. The bill establishing this program called for a cooperative effort between the Texas Department of Health and The University of Texas System to conduct studies that would address the health effects of exposure to Agent Orange.

Pilot Studies of Vietnam Veterans

Faculty of The University of Texas developed protocols for pilot studies of selected veterans in the Texas Veterans Agent Orange Program.

Three pilot studies were selected for implementation. These were cytogenetic testing, sperm evaluation, and analysis of the immune response in putatively exposed veterans and suitable control subjects.

Cytogenetic testing to be conducted at The University of Texas System Cancer Center, will determine if Vietnam veterans presumed to have been exposed to Agent Orange during their military service have more genetic damage as measured by chromosomal abnormalities in cultured lymphocytes than does a suitable comparison group of veterans presumed not to have been exposed to Agent Orange. Sperm evaluation, to be conducted at The University of Texas Medical Branch at Galveston, will determine whether an association can be detected between current production of abnormal sperm and prior exposure to Agent Orange. The percentage of morphologically abnormal sperm and the incidence of nondysjunction of the Y chromosome will be assessed in this study. Analysis of the immune response, to be conducted at The University of Texas Health Science Center at Houston, will compare the immunocompetency of Vietnam veterans thought to have been exposed to Agent Orange with that of age-matched controls having no history of exposure to Agent Orange.

In addition, a birth defects study was to be initiated by the Division of Clinical Genetics of The University of Texas Health Science Center at Dallas. A summary of this study by Jan M. Friedman, M.D., Ph.D. is attached.

Study Limitations

Every attempt was made to explain the inherent limitations of these studies to all concerned with their outcome. These include, briefly:

- Inability to establish a reliable index of exposure to Agent Orange for any individual Vietnam veteran. No exposure index was available from the Department of Defense, Veterans Administration, or other official source.

• Control subjects could be selected on gross variables such as obvious lack of previous contact with Agent Orange. Ability to match on other variables was limited.

• Because exposure occurred over a decade ago, damage or adverse consequences of such exposure may have diminished to an extent that they are no longer detectable.

• The tests performed in the pilot studies are not specific for measuring effects of Agent Orange or any other specific agent.

• Chromosome damage, sperm abnormalities, and altered immune responsiveness can result from any number of causes; therefore, it will not be possible to conclude that any abnormal findings in the group or in any individual are due to Agent Orange.

• Individuals whose test results are positive cannot be offered therapeutic manipulations or corrective intervention in that there is no known way of reversing chromosomal damage or sperm abnormalities.

• Negative results of the pilot tests would not prove the absence of other, less easily or impossible to measure, effects.

Although these limitations are substantial, the laboratory-based pilot studies represent a positive step toward resolution of the Agent Orange dilemma. These studies have become part of a diverse and rapidly expanding national effort to answer pressing questions about the health effects of herbicides used in Vietnam. In addition, results of these initial pilot studies could suggest avenues for future scientific investigations of this national concern.

Agent Orange Subject Selection Committee Criteria/Selection Methodology

The Agent Orange Subject Selection Committee was established to review evidence (military records, medical records, and other supporting documents) which would indicate if a given veteran was indeed exposed to Herbicide Orange in Vietnam, and if so how much exposure occurred.

Seven criteria were used to evaluate a given veteran's category of exposure. Depending on the combination of exposure variables veterans were classified into one of six exposure categories. These categories included: highly exposed, medium to highly exposed, medium exposed, low to medium exposed, low exposed and disqualified.

Those veterans deemed to be in the highly exposed category were then included in the Pilot Phase of the clinical studies. These studies included cytogenetic testing, immune competency, and sperm mobility and motility assessment.

The criteria which the committee considered when reviewing the military records, medical records, questionnaire, and other supporting documents included the following.

1. Exposure to herbicides. The committee noted the amount (in gallons) of Herbicide Orange, White, and Blue sprayed in the area where the veteran was assigned during the time period he was assigned to that area. This criterion included estimated rates of exposure and exposures other than "Ranch Hand" exposures.

2. Reported symptoms

A. At the time of exposure: since the chloracne rash is pathognomonic of exposure to dioxin, the committee considered the appearance of a rash at exposure in evaluating the individual's exposure status.

B. After time of exposure: reports of chloracne after initial exposure were also considered by the committee for evaluation of exposure.

3. Current medical problems. The occurrence of current disease which could possibly be related to herbicide exposure was viewed by the committee as an important criterion for evaluating exposure status.

4. Current or past occupational chemical exposure. Since exposure to non-herbicide related chemicals could occur on the job outside the military, the committee regarded such occupational exposure as a potential confounding factor in the evaluation of exposure status. Such exposure could disqualify a veteran from participating in the Pilot Phase.

5. Miscarriages or stillbirths. The potential genotoxic effects of phenoxy herbicides, including Herbicide Orange were noted by the committee. Hence, the occurrence of miscarriage or stillbirth among the offspring of the veterans was considered when evaluating the exposure status of a veteran.

6. Birth defects. As in (5) above, the phenoxy herbicides are potential teratogens in addition to being mutagens and carcinogens. Hence, the committee noted the occurrence of birth defects in evaluating exposure status.

7. Dates and types of service duty. The heaviest spraying of Herbicide Orange in Vietnam occurred between 1967 and 1969. All spraying operations ceased in early 1971. Hence, the committee closely evaluated the service dates in Vietnam in establishing the exposure status. Also, duty type in Vietnam was considered. Clerks, truck drivers, repairmen, and personnel assigned to base camps were not considered to be at high risk of exposure in comparison to infantrymen in the field where potential exposure was much higher.

The following table (Table 1) demonstrates the relative importance of each of the selection criteria used by the committee in arriving at a judgment of exposure status. The percentages reflect the importance the committee placed on each criteria in placing veterans in a given exposure category.

Table 1.

Percentage Summary of Criteria Considered in Exposure Classification of 255* Vietnam Veterans

Exposure Status Criteria	High	Med./High	Medium	Low/Med.	Low
Exposure (Gallons)	96.4	100.0	94.7	100.0	52.2
Symptoms at Exposure	42.3	46.1	13.1	16.6	0.0
Symptoms After Exposure	42.3	61.5	18.4	16.6	0.0
Current Medical Problems	70.5	84.6	31.5	50.0	0.0
Occup./Chemical Exposure	4.7	0.0	2.6	33.3	5.9
Miscarriages	18.8	15.3	10.5	50.0	1.4
Birth Defects	11.7	15.3	10.5	83.3	0.0
Dates and Type of Service	94.1	100.0	68.4	16.6	5.9
Total No. Veterans	85	13	38	6	67

*46 veterans were disqualified from the pilot phase of the study for various reasons. Veterans who had previously received chemotherapy were disqualified since such treatment would affect cytogenetic and immune parameters. In addition, veterans with occupational exposure to chemicals which could affect laboratory testing of sperm, cytogenetic or immunological parameters were removed from further consideration.

As of February 29, 1984, the Selection Committee reviewed 320 cases of which 99 were selected for the clinical studies (fifty cases were reviewed more than once after more information had been obtained).

The goal set for the pilot studies was 50 veterans selected for having received the highest possible exposure to Agent Orange based on all available information. Thus, the study group was intentionally skewed toward exposure and was not intended to be "representative" of veterans who claimed exposure. Nor within the study group was there a gradient from high to low exposure. All veterans in the study group were selected for high exposure. A dose-response effect was, therefore, not built in to the pilot study design. The controls, by contrast, were intentionally selected because of no possible exposure to Agent Orange in Vietnam. Matching for associated factors such as occupation or for other sources of exposure to dioxin was attempted, but was recognized to be imprecise.

The intentional study design to include maximum possible exposure among cases (Vietnam veterans) contrasted to least likely exposure among comparison subjects (matched controls) was selected because there was virtually no literature describing similar studies in humans. Since these pilot studies represented a "first," it was thought most desirable to design the study for maximum likelihood of detecting a biologic abnormality among the veterans, if one existed and could be measured by the available methods used.

Collection of samples of specimens from both veterans and controls was arranged by staff of the TDH and shipped to the individual investigators. Samples were coded so that the tests were performed in all three laboratories without knowledge of whether the sample was from a veteran or a control (specimens were "blinded"). After all specimens were analysed by the

laboratories the code was sent to each investigator on the same day so that appropriate analyses could be performed.

Preliminary Results of the Pilot Studies

A summary of findings of the three pilot studies are presented. All three studies were performed on specimens from the same Vietnam veterans and controls. The total numbers in each group may vary from study to study and from specimen to specimen. These do not represent errors, rather they indicate variability among the techniques used for the studies.

The investigator(s) along with their title and affiliation are given for each study. They can provide more technical details if requested.

Cytogenetic Testing

T. C. Hsu, Ph.D., Principal Investigator

Professor of Cell Biology

Sen Pathak, Ph.D., Collaborator

K. L. Satya-Prakash, Ph.D., Collaborator

The University of Texas System Cancer Center

M. D. Anderson Hospital and Tumor Institute

Each blood sample was set up for short-term culture with standard blood culture medium. Cell chromosomes were examined at 48 and 72 hours after initiation of cultures. This technique is standard and has been published by Dr. Hsu and his colleagues.

Each cell speciman was critically examined for chromosome changes. These include:

1. Chromatid breaks, isochromatid breaks and exchanges.

2. Chromosomes showing acentric fragments, dicentrics, rings, and marker chromosomes indicating translocations.

The percentage of cell specimens with chromosome breaks and chromatid breaks were recorded. The frequency of chromosome changes was calculated as breaks per cell (b/c). In previous studies of large numbers of patients, families, and population subjects the b/c ratio was found to be the most useful expression of genetic damage.

The results of this pilot study of cytogenetics on veterans exposed to Agent Orange and matched controls are summarized below:

Table 2.

Cytogenetic data on veterans and controls

	Vietnam Veterans	Matched Controls
% cells with chromosome breaks	0.78	0.62
breaks/cell (b/c)	0.03	0.02

Table 3.

Cases with Chromosome-type Aberrations and Breaks/Cell

Cytogenetic Change	Vietnam Veteran No.	(%)	Matched Control No.	(%)
Metaphases with Chromosome-type abberrations *				
0.0 - 0.9	17	(56.7)	22	(73.4)
1.0 - 1.9	9	(30.0)	4	(13.3)
2.0 - 2.9	2	(6.7)	3	(10.0)
3.0 - 3.9	1	(3.3)	0	(0.0)
4.0 - 4.9	1	(3.3)	1	(3.3)
5.0 and over	0	(0.0)	0	(0.0)
	30	100.0	30	100.0
Breaks/cell *				
0.00 - 0.02	16	(61.5)	20	(66.7)
0.03 - 0.07	7	(26.9)	10	(33.3)
0.08 - 0.12	2	(7.7)	0	(0.0)
0.13 and over	1	(3.9)	0	(0.0)
	26	100.0	30	100.0

* Chi square not significantly different between veterans and controls.

Interpretation and Conclusion:

It should be pointed out that the lack of positive results does not necessarily indicate the lack of genomic toxicity in persons soon after the Agent Orange exposure. Genetic effects induced by Agent Orange, if any, might have been sufficiently diluted by years of lymphocytic proliferation. In other words, we do not have a complete chronological study following persons, before, soon after, and long after exposure to a genotoxic agent. However, the present data, collected some 15 years after the exposure, appear negative.

Sperm Tests

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Up to 3 semen specimens were obtained from each study subject at 2 and 3 month intervals. Upon receipt of the samples, a sperm count was determined, morphology (appearance) was classified by shape and size using standard, published methods. Reference slides were randomly included to serve as an internal control for scoring consistency. At least 500 sperm were examined per sample and the percentage of morphologically abnormal sperm was recorded. The percentage of fluorescent bodies (F-bodies) was recorded as well.

The results are shown in the table below:

Table 4.

Mean Values (± Standard Deviation)

of Sperm Test Results for Veterans and Controls

Sperm Characteristics	Vietnam Veterans (Mean ± SD) (No. Subjects/ Samples)	Matched Controls (Mean ± SD) (No. Subjects/ Samples)
Sperm Count	103.7 ± 76.0	116.3 ± 79.3
($X\ 10^6$)	32 (76)	32 (64)
P = 0.43*		
% Morphologically	50.6 ± 14.8	48.7 ± 12.6
Abnormal	31 (73)	31 (61)
P = 0.78		
% One F-body	47.7 ± 2.1	47.8 ± 2.5
P = 0.96	30 (70)	30 (58)
% Two F-body	0.7 ± 0.2	0.7 ± 0.3
P = 0.82	30 (70)	30 (58)

*Kolmogorov-Smirnov 2 sample test used for significance of difference of mean values

Interpretation and Conclusion:

The results of the sperm tests are reported for 32 pairs of veterans and non-veteran controls. No statistically significant differences were observed between the two groups for sperm count, abnormal morphology and 2 F-body frequency. The preliminary conclusion is that none of the three tests employed demonstrated any effect among individuals with prior military service in Vietnam where exposure to herbicide was probable. However, based on the numbers tested, large differences in sperm count could escape detection, while small differences in morphology and F-body frequency could exist, which would not have been detected.

Immunologic Studies

The immune system is charged with the defense of the body against both internal as well as external antigenic challenges. The cells which make up this system are several different types of lymphocytes - T and B cells, macrophages, and a poorly characterized cell referred to as null cell. T-lymphocytes (derived from the thymus gland, hence also called T-cells) play a central role in the overall regulation of immune responses, including both antibody synthesis and the development of cell-mediated immunity.

Several measures of T-cells and their functions were determined from blood lymphocytes of Vietnam veterans and matched controls. A brief description of these is given below:

Table 5.

Test Performed	Explanation of Test
% Total T-RFC	All T-cells in the peripheral blood leukocytes (PBL) as measured by sheep red blood cell rosette formation (RFC).
% Pan-T cells	All T-cells in PBL measured by monoclonal antibody (OKT 3).
%Active T-RFC	Subpopulation of T-cells which function as immune surveillance cells.
% Helper/Inducer T cells	"Helper T cells" required for antibody formation, measured by monoclonal antibody OKT 4.
% Suppressor/Cytotoxic T cells	"Suppressor T cells" suppress antibody response after initiated, measured by monoclonal antibody OKT 8.
Helper/Suppressor Ratio	Ratio of T-helper to T-suppressor cells.
% HNK	Human natural killer cells measured by Leu 7.
% OKT 9	T cell activational antigen measured by OKT 9.
% OKT 10	T cell activational antigen measured by OKT 10.
PMLC (S.I.)	Panel of mixed lymphocyte culture, measures ability to respond to 3-5 peripheral blood leukocytes.

Table 5. (Continued)

Test Performed	Explanation of Test
PHA (S.I.) S.I. = Stimulation Index	Response to a mitogen stimulant, phytohemagglutinin
Spont. Blasto.	Spontaneous blastogenesis, measure of metabolic activity of round cells in peripheral blood leukocytes.

The numbers of individuals tested, the mean values for the groups and the standard deviation are given in the table below:

Table 6.

Mean Values (± Standard Deviation) of Immune Tests Results for Veterans and Controls

Immune Test	Vietnam Veterans (n=66)	Matched Controls (n=50)
Total T-RFC	38 ± 15	44 ± 19 *
Pan T cells	61 ± 13	64 ± 13
Active T-RFC	20 ± 15	14 ± 11*
Helper T cell (Inducer)	39 ± 11	39 ± 10
Suppressor T cell (Cytotoxic)	24 ± 10	23 ± 8
Helper/Suppressor Ratio	1.8 ± 0.8	1.8 ± 0.7
HNK	11 ± 6	12 ± 7
OKT-9	3 ± 5	3 ± 1
OKT-10	5 ± 11	6 ± 7
PMLC (S.I.)	29 ± 21	22 ± 13
PHA (S.I.)	114 ± 90	98 ± 78
Spont. Blasto.	17,367 ± 9,787	19,943 ± 10,136

*Statistically different at P less than 0.05.

Interpretation and Conclusion:

Of the 12 measures of the immune system examined in this pilot study, the Active T-RFC was higher among the Vietnam veterans (20 ± 15) than among the matched controls (14 ± 11), (P less than 0.05). This test measures the % of Active T-cells which is the subpopulation of T-lymphocytes that function as immune surveillance cells. These cells are a subpopulation of the total T-RFC cells, which is reflected in a decrease of the % total T-RFC among Vietnam veterans (38 ± 15) compared to matched controls (44 ± 19), (P less than 0.05).

Summary:

Because of concerns of Vietnam veterans that exposure to Agent Orange and its contaminants may have caused adverse health effects, The University of Texas System working closely with the Texas Department of Health, initiated three pilot research projects. These were (1) a study of the cellular characteristics of lymphocytes in the peripheral blood (cytogenetics), (2) a study of the number and physical appearance of sperm, and (3) several measures of the immune system.

Vietnam veterans were purposely chosen who had the greatest likelihood of heavy exposure and were compared with age matched individuals with maximum likelihood of no exposure. The pilot phase called for 50 veterans and 50 matched controls. Specimens were coded so that their identities were blinded to the investigators when the laboratory tests were performed.

The several limitations of these studies were made known from the beginning to concerned and interested individuals.

Preliminary results of the three pilot studies are:

Cytogenetic Testing. No differences were found between the % of cells with chromosome breaks or the number of breaks per cell between Vietnam veterans and matched controls.

Sperm Tests. No differences were found between the number of sperm, appearance of sperm, or percent of fluorescent bodies of sperm between Vietnam veterans and matched controls.

Immunologic Studies. Of 12 tests performed to measure the immune system, the % Active T-RFC (which measures immune surveillance cells) was higher among Vietnam veterans than among the matched controls (P less than 0.05). The % Total T-RFC was lower among veterans than among controls (P less than 0.05).

SUMMARY OF U.T. AGENT ORANGE
BIRTH DEFECTS STUDY
26 MARCH, 1984

Data for the period 1 February, 1982 - 1 February, 1984

Center	New Patients Seen	Paternal Agent Orange Exposure*
UTHSC Dallas	1,233	17
UTHSC Houston	2,966	8
UTHSC San Antonio	698	5
UT Medical Branch	439	3
TOTAL	5,336	33 = 0.6%

Disease Type	Frequency in General Patient Population (Based on Partial Data)	Frequency in Children of Agent Orange-Exposed Fathers*
Possibly due to Agent Orange exposure in father (sporadic dominant or chromosomal anomaly)	15%	18%
Not due to Agent Orange exposure in father (inherited dominant or chromosomal anomaly, autosomal recessive, or X-linked recessive)	18%	3%

(Differences are marginally statistically significant)

Estimates of Frequency of Agent Orange Exposure*
in Fathers of Children With Birth Defects
of Certain Etiological Classes

Class	
Conditions possibly due to Agent Orange exposure in father	0.75% (Difference is marginally statistically significant)
Conditions not due to Agent Orange exposure in father	0.1%

CONCLUSION: Trend observed is consistent with fathers' exposure to Agent Orange causing birth defects in offspring, but numbers are very small; most fathers in the "exposed" group do not actually claim exposure; and the trend has become less clear as more data are collected.

RECOMMEND: Continue data collection phase for 1 more year and re-evaluate at that time.

J.M. Friedman, M.D., Ph.D.
Associate Professor of Obstetrics
and Gynecology and of Pediatrics
Head, Division of Clinical Genetics

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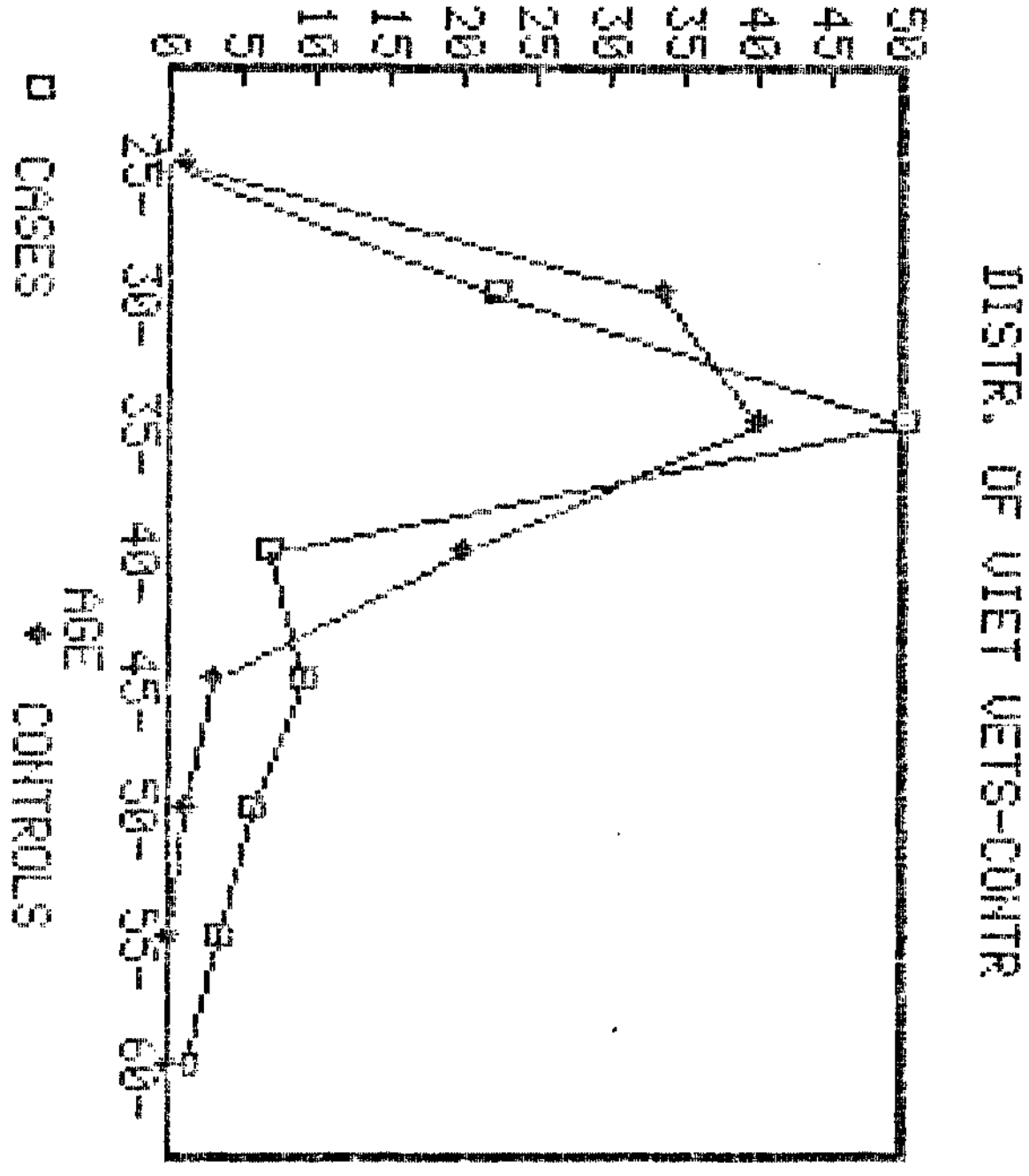
*Defined as military service in Southeast Asia between 1969 and 1971. Most fathers were unaware of direct exposure to Agent Orange.



ANALYSIS OF MAJOR DEMOGRAPHIC STATISTICS
FY 82,83,84 AGENT ORANGE CLINICAL STUDIES

MAY 3, 1985 REPORT TO THE TEXAS AGENT
ORANGE ADVISORY COMMITTEE BY
GUY R. NEWELL, JR., M.D., CHAIRMAN

Demographic Characteristics of Vietnam Veterans and Controls

Characteristic	Vietnam Veterams (n=84)	Controls (n=65)	P Value
	(%)	(%)	
Race			0.44
Black	11.9	4.6	
Hispanic	15.5	13.8	
White	71.4	80.0	
Other	1.2	1.5	
Language Spoken			0.67
English	85.7	86.2	
Spanish	13.1	13.8	
Other	1.2	0.0	
Religion			0.58
Protestant	65.5	64.6	
Catholic	26.2	33.8	
Other	8.4	1.5	
Marital Status			0.66
Married	66.7	76.9	
Single	13.1	9.2	
Separated	2.4	1.5	
Divorced	16.7	12.3	
Education			0.0001
Through High School	35.7	13.8	
Through College	56.0	53.8	
Post College	8.3	32.3	
Income/Year			0.0001
<$5,000	13.2	0.0	
5-<10,000	17.1	3.1	
10-<20,000	21.1	10.8	
20-<30,000	23.7	27.7	
30-<40,000	17.1	27.7	
40-<50,000	3.9	18.5	
>50,000	3.9	12.3	

Current Consumption of Tobacco

Type of Tobacco	Vietnam Veterans (n=84)	Controls (n=65)	P-Value
	(%)	(%)	
Cigarettes (Pk/Yrs)			
Yes	52.5	35.5	0.04
<9	20.0	28.6	
9-<20	20.0	19.0	
20-<26	17.5	23.8	
26-<41	22.5	9.5	
41+	20.0	19.0	
Cigars			
Yes	1.8	3.7	0.97
No	98.2	96.3	
Pipe			
Yes	8.1	5.5	0.85
No	91.9	94.5	
Chewing			
Yes	8.9	3.7	0.46
No	91.9	96.3	

Current Consumption of Beverages

Beverage	Vietnam Veterans (n=84)	Controls (n=65)	P Value
	(%)	(%)	
Decaffeinated Coffee			0.24
None	76.9	84.9	
1-4 cups/day	18.5	15.1	
5+	4.6	0.0	
Regular Coffee			0.65
None	32.1	29.7	
1-4 cups/day	52.6	59.4	
5+	15.4	10.9	
Tea			0.83
None	36.8	33.3	
1-4 cups/day	63.2	66.7	
Cola, Regular			0.27
None	31.9	30.5	
1-4	63.9	69.5	
5+	4.2	0.0	
Cola, Dietetic			0.59
None	85.5	80.0	
1-4	14.5	20.0	
Beer			0.92
None	49.3	52.5	
1-4	46.6	44.1	
5+	4.1	3.4	
Wine			0.69
None	89.1	92.9	
1-4	10.9	7.1	
Liquor			0.21
None	89.4	79.7	
1-4	10.6	20.3	

History of Drug Use

Type of Drug	Vietnam Veterans (n=84)	Controls (n=65)	P Value
	(%)	(%)	
Medication, Regularly Prescribed			0.004
Yes	51.9	27.9	
No	48.1	72.1	
Medication, Past 60 Days			0.22
Yes	58.2	45.5	
No	41.8	54.5	
Recreational Drug			1.00
Yes	8.5	7.7	
No	91.5	92.3	

History of Exposure to Chemicals

Exposure		Vietnam Veterans (n=84)	Controls (n=65)	P value
		(%)	(%)	
Routinely Exposed				0.85
	Yes	30.5	27.7	
	No	69.5	72.3	
Symptoms Related to Chemical Exposure				0.06
	Yes	8.8	1.5	
	No	91.2	98.5	
Solvent				1.00
	Yes	2.7	3.1	
	No	97.3	96.9	
Paints				0.64
	Yes	10.1	14.1	
	No	89.9	85.9	
Pesticides				1.00
	Yes	5.3	4.7	
	No	94.7	95.3	

History of Exposure to Specific Chemicals

Chemical	Vietnam Veteran	Control	P Value
	(%)	(%)	
Solvent			1.00
Yes	2.7	3.1	
No	97.3	96.9	
Paints			0.64
Yes	10.1	14.1	
No	89.9	85.9	
Pesticides			1.00
Yes	5.3	4.7	
No	94.7	95.3	

Miscellaneous History

History	Vietnam Veterans (n=84)	Controls (n=65)	P value
	(%)	(%)	
Family History of Cancer			0.76
Yes	41.7	47.7	
No	53.6	47.7	
Unknown	4.8	4.6	
History of Cold or Flu			0.16
Yes	48.2	35.4	
No	51.8	64.6	
History of Vasectomy			1.00
Yes	20.2	20.0	
No	79.8	80.0	
X-Rays for Diagnosis			0.001
Yes	36.6	9.2	
No	63.4	90.8	

Present or Past Employment by Occupation

Occupational Titles	Vietnam Veterans No.	(%)	Control No.	(%)
Professional, Technical, and Managerial	47	(20.4)	107	(55.7)
Clerical and Sales	27	(11.7)	31	(16.1)
Services	33	(14.3)	20	(10.4)
Agricultural, Fishery, Forestry	6	(2.6)	4	(2.1)
Processing	6	(2.6)	3	(1.6)
Machine Trades	42	(18.3)	7	(3.6)
Benchwork	6	(2.6)	2	(1.0)
Structural Work	41	(17.8)	7	(3.6)
Miscellaneous	22	(9.6)	11	(5.7)
Total	230		192	
No. of Individuals	83		65	
No. per Individual	2.8		3.0	

$\chi^2_{10} = 80.22$, $P = 1.00$

Present or Past Employment by Industry

Standard Industrial Classification	Vietnam Veterans No.	(%)	Control No.	(%)
Agriculture, Forestry and Fishing	5	(2.2)	4	(2.1)
Mining	3	(1.3)	2	(1.0)
Construction	20	(8.6)	5	(2.6)
Manufacturing	28	(12.1)	18	(9.4)
Transportation Communications Electric, Gas and Sanitary Services	25	(10.8)	9	(4.7)
Wholesale Trade	7	(3.0)	5	(2.6)
Retail Trade	30	(12.9)	22	(11.5)
Finance, Insurance and Real Estate	10	(4.3)	5	(2.6)
Services	36	(15.5)	60	(31.3)
Public Administration	64	(27.6)	61	(31.8)
Not Classified	4	(1.7)	1	(0.5)
Total	232		192	
No. of Individuals	83		65	
No. per Individual	2.8		3.0	

$\chi^2_{10} = 26.58$, P = 1.00

History of Major Health Problem

History	Vietnam Veteran (n=77)	Control (n=64)
Yes	32 **(41.6%)**	13 **(20.3%)**
No	45 **(58.4%)**	51 **(79.7%)**

$\chi^2_1 = 6.3$, $P = 0.01$

Twice as many Vietnam veterans gave a history of a major health problem as did controls.

Frequency of "Major" Health Problems

Health Problem	Veterans No.	Veterans (%)	Controls No.	Controls (%)
HBP	15	35.7	7	41.2
Heart Irregularity	1	2.4	1	5.9
LBP	0	--	1	5.9
High triglycerides	0	--	1	5.9
Heart disease, NOS	2	4.8	1	5.9
Rh art	1	2.4	1	5.9
Ulcerative colitis	2	4.8	0	--
Low blood sugar	0	--	1	5.9
Chronic bronchitis	0	--	1	5.9
Hypersensitive insects	0	--	1	5.9
High blood sugar	0	--	1	5.9
Gout	0	--	1	5.9
Ulcers	1	2.4	0	--
Hidradenitis	1	2.4	0	--
Feels sickly	1	2.4	0	--
Anxiety	3	7.1	0	--
Tbc	1	2.4	0	--
Chloracne	1	2.4	0	--
Liver cirrhosis	1	2.4	0	--
Blood disorder	1	2.4	0	--
Headaches	1	2.4	0	--
Insomnia	1	2.4	0	--
Chronic proctitis	1	2.4	0	--
Spinal fracture	1	2.4	0	--
Combat injury	1	2.4	0	--
Diabetes	3	7.1	0	--
Chronic discoid	1	2.4	0	--
Edema	1	2.4	0	--
Hepatitis	1	2.4	0	--
Total	42		17	
No. persons	32		13	
Problem/person	1.3		1.3	
Heart problems	18/42	(42.9%)	11/17	(64.7%)

History of Work and Chemical Exposure

Exposure	Vietnam Veterans (n=82)	Controls (n=65)
Yes	25 **(30.5%)**	18 **(27.7%)**
No	57 **(69.5%)**	47 **(72.3%)**

$\chi^2_1 = 0.14$, $P = 0.85$

History of Work and Chemical Exposures

Types of Exposure	Veterans No.	Veterans (%)	Controls No.	Controls (%)
Noise/sound	15	50.0	6	19.4
Radiation	2	6.7	4	12.9
Heat	4	13.3	1	3.2
Embalming fluids	0	--	1	3.2
Solvents	1	3.3	3	9.7
Fumes	3	10.0	1	3.2
Leaded gasoline	0	--	1	3.2
Paint thinner	0	--	1	3.2
Tylene	0	--	1	3.2
Phenol	0	--	2	6.5
Alcohols	0	--	1	3.2
Acids	0	--	1	3.2
Ether	0	--	1	3.2
Mold spray	0	--	1	3.2
Insecticides	2	6.7	1	3.2
Epoxy	0	--	1	3.2
Monomers	0	--	1	3.2
Miscellaneous	3	10.0	3	9.7
Total exposures	30		31	
No. exposed	25		18	
Exposures/person	1.2		1.7	

DEPARTMENT OF THE ARMY
OFFICE OF THE ADJUTANT GENERAL
ARMY AGENT ORANGE TASK FORCE
ROOM 210, 1730 K STREET N.W.
WASHINGTON, DC 20006

REPLY TO
ATTENTION OF

HERBICIDE STATUS REPORT

The name Herbicide Orange comes from the identifying orange stripe painted on the drums containing a particular herbicide which contained equal proportions of the commercially-available herbicides 2,4-D and 2,4,5-T. These herbicides have been used extensively and in large quantities in agriculture and forest management in the United States (US) as well as worldwide for more than three decades. Only the 2,4,5,-T has been implicated as causing any potential health problems due to the presence of toxic contaminant - dioxin (2,3,7,8,-tetrachloro-dibenzo-paradioxin (TCDD)) - which is formed in low concentrations (parts per million) in the manufacturing process of the herbicide.

At the request of the President of the Republic of Vietnam (RVN), the use of herbicides in Vietnam was approved by the President of the United States to primarily deny cover to the enemy and, secondarily, to deny food crops to the enemy. This was done only after testing in Florida, Hawaii, and South East Asia during 1961-1962, and limited operational use during 1962-1965. At that time, the herbicides used had the desired effects of improving visibility in dense jungles and were then believed to be harmless to humans. From 1965 to 1970, extensive aerial spraying was carried out over approximately 10 percent of the land mass of RVN, dispersing 11,300,000 gallons of Herbicide Orange in over 6,000 separate missions conducted by the U.S. Air Force under the code name "Ranch Hand". The missions were often carried out in remote or enemy-controlled areas as a result of the military need to improve observation of enemy activity and to reduce the potential for ambush. Each mission was carefully approved by identical staffing procedures within the US and RVN chains of command. The missions were flown under strict meteorological and operational conditions designed to minimize the drift of herbicide. Additionally, US and RVN commanders were advised to keep their troops out of the target areas at the time of spraying so that Vietcong groundfire might be returned by the fighter aircraft protecting the spraying missions. Nonetheless, spraying did occur over US troop positions. These missions are now recorded on computer tape (HERBS tape).

In a typical spraying of dense jungle, tests have shown that only 6 percent of the herbicide reached the ground. At normal rates of application, this equals 4 millionths of a pound per acre of the contaminant 2,3,7,8-TCDD. Repeated testing reveals that 2,3,7,8-TCDD is rapidly detoxified by exposure to daylight in a matter of days, with a

half-life of approximately 6 hours. However, pure dioxin which has penetrated below the surface of the soil will persist for years, though it, too, will slowly detoxify. Dioxin is very insoluble in water and has a low vapor pressure.

From 1965 on there are detailed computerized records of the dates, locations, types and amounts of herbicide used in fixed-wing "Ranch Hand" spray missions. The enclosed copies of maps, which were drawn from the records of spraying missions, show the locations of all "Ranch Hand" defoliation and crop destruction missions from 1965 to 1971. Herbicides were used, additionally, to clear the perimeter areas around US and RVN bases and along routes of communications to deny the enemy concealment capability and were applied with hand sprayers, and from tank trucks, riverine boats, and helicopters. While there are records of over 3,000 of these smaller scale applications, a complete compilation and computerization has not yet been accomplished, as documenting the instances and locations of firebase perimeter spraying is a painstaking, time consuming process. The DOD, however, considers this as another possible source of exposure and we are, therefore, continuing to search the records to determine the locations, dates, and magnitude of this type of perimeter herbicide spraying. The RVN armed forces are known to have used aerially dispersed herbicides; however, no records exist of this usage. Finally, a small amount of herbicide was applied during 1967 - 1969 in the Demilitarized zone (DMZ) in Korea. This was applied by hand spray apparatus and from trucks operated by Korean Army personnel. No US troops are known to have been involved or exposed in Korea.

A study by Monsanto Chemical Company, of an accident which occurred at their Nitro, West Virginia facility in 1949 has not shown an excess of deaths, cancers or heart disease among the 122 male workers who were conclusively proven to have been exposed to dioxin, in this incident when compared to the general US population. A similar study by Dow Chemical Company of 61 males exposed during a 1964 accident failed to establish a cause and effect relationship. However, because of the small population size in each of these studies, there is an acknowledged limited capacity for detection of normally infrequently occurring abnormalities or effects. Reflecting worldwide interest in the subject, studies of other similar accidents, including the one at Seveso, Italy, in 1976, are being conducted. Recent studies from Europe on forestry, agriculture and railroad workers suggest that two kinds of cancer, lymphoma and soft tissue sarcoma, may result from chronic, high exposure to dioxin. In animal studies, dioxin has been shown to be capable of acting as a promoter of cancer, fetal death and congenital defects but, to date, these effects have not been confirmed in humans. The reproductive effects have so far been observed only in pregnant rats and mice from large doses of dioxin, but not in rabbits, sheep or monkeys. There are marked species differences in sensitivity to dioxin's effects. A recently completed study of male mice exposed to dioxin did not show any increase in fetal deaths or fetal abnormalities in the mated

females thus reducing concern about male-transmitted congenital abnormalities. An extensive study of the use and effects of herbicides in Vietnam was conducted by the National Academy of Sciences (NAS) and was reported to Congress in 1974. That study did not identify any specific health problems.

Present interest in Herbicide Orange use in Vietnam centers on a wide range of exposures, from very low to high, actual and potential. Much of the present difficulty with the herbicide issue stems from the lack of concrete information about exposure and its consequences, expecially at low dose levels. There are no known, proven effects on health or reproduction from exposure to low levels of 2,4,5-T or dioxin. Nor do the health complaints voiced by those who believe they may have been exposed to Herbicide Orange fall into any discernible pattern. There is no significant marker or unusual condition such as chloracne, the rare skin condition which is a uniform sign of large, acute exposures to dioxin, to serve as a specific clue that low level exposure may have occurred. For example, with exposure to polyvinyl chloride or asbestos the remarkably consistent high incidence of otherwise very rare cancers substantially hastened an association of exposure to these substances and subsequent ill health. However, such a causal relationship has not been the case with dioxin. Thus, to date, there is no scientifically proven evidence that exposure to dioxin in very low doses leads to ill health or genetic defects. However, the matter is not being allowed to rest on that conclusion.

There are many studies presently being carried on, both in and outside the Government, which are designed to investigate many of the unknown aspects of herbicide exposure. The lack of definitive information has heightened public and private concern about the possible human effects of exposure to dioxin. Within the DOD, the Air Force is conducting a study of the 1,200 men from "Ranch Hand" who performed the fixed-wing spraying of herbicides in Vietnam. The Ranch Hand study has been projected over a 20-year period and will be studying the long term health of the members of the "Ranch Hand" crews. The conclusions for the initial phase of this study, which was released in July 1983, were not indicative of a cause and effect relationship.

The conduct of an epidemiology study, originally to be by the Veterans Administration, has been assumed by the Centers for Disease Control (CDC) in Atlanta, and will examine the health of ground troops who were likely exposed to herbicide, as well as those who were likely not exposed to herbicides. Additionally, there will be considered the broader question of health effects of service in Vietnam in general, as it is possible that troops in Vietnam may have been exposed to other potentially toxic substances and exotic diseases. In addition to this large scale study (30,000 soldiers), the Centers for Disease Control is conducting a study to examine the possibility of increased incidence of congenital abnormalities among the offspring of Vietnam veterans. These studies will take several years to complete; however,

they offer the best possible hope of definitive answers to questions which at present have no answers.

Critical to these studies, and to concerned individuals, will be information about whether a given individual was actually exposed to Herbicide Orange. In 1980, the Department of Defense initiated an intensive search of Army and Marine Corps unit operational records, morning reports/unit diaries, Combat After Action Reports, and other related troop movement records to determine if it would be possible to correlate locations of battalion and company size units with the Ranch Hand spray missions. We have found it is possible to identify certain selected companies as having been within close proximity of fixed-wing herbicide spray missions.

The legislation of PL 96-151 mandated the Veterans Administration to conduct a study of possible health effects related to Agent Orange exposure. Following subsequent Congressional hearings, it was determined, since the majority of personnel who served in Vietnam were Army affiliated, that the Army would play the foremost role in providing the Department of Defense related data to support the VA's and related studies. Consequently, on 21 May 1980, The Adjutant General of the Army established the Army Agent Orange Task Force, drawing on the expertise of staff members already experienced in research methods and intensely familiar with the organization of the Vietnam War records collection. The Army Agent Orange Task Force, originally three full-time and two part-time members, now has a complement of 29 personnel and includes representation from the Air Force, Navy, and Marine Corps, comprising a joint services staff effort to support the veterans. The role of the Task Force involves in-depth research into the Vietnam War records of all branches of the services to locate units, identify those in relation to known herbicide spray missions, identify personnel within units, record incidents of herbicide sprays found in the records and previously undocumented, and to provide support to state and federal agencies conducting Agent Orange related studies.

The records searches have demonstrated that there are significant differences in the quality, completeness and accuracy of the data contained in the records of the many units involved. It was never envisioned that these records, compiled and organized under combat conditions, would ever have to serve as the basis for scientific studies in determining exposure probabilities. Hence, some of the information needed is simply not available.

During 1981, while DOD personnel were researching troop movement records, another possible source of exposure to herbicides was uncovered -- aircraft mission incidents. Records found to date indicate that over the years during which Ranch Hand missions were carried out, there were 155 incidents. These incidents were necessitated for a variety of reasons -- engine failure, bad weather, radio malfunction,

navigational errors/problems and, in some instances, battle damage to aircraft. A mission incident did not necessarily mean that the pilot "dumped" the herbicide; however, the herbicide could be rapidly jettisoned through an emergency dump valve in less than a minute, to lighten the aircraft. To date, we have documented that emergency releases of herbicides took place 126 times, 58 of which definitely involved Herbicide Orange. The majority of these releases occurred at high altitudes, over the sea, or in remote areas in the vicinity of enemy held targets. A few, nonetheless, did occur near our bases.

Those individuals who have unresolved health concerns from possible exposure to herbicides while serving in Vietnam may contact their nearest Veterans Administration hospital or regional office. Those persons still serving on active duty in the military services should contact their service medical facility.

We remain dedicated to seeking answers to questions relative to Herbicide Orange and other dioxin-contaminated substances.

AGENT ORANGE STUDIES IN PROGRESS
Compiled by the Veterans Administration

STUDY	AGENCY	DESCRIPTION	PROJECTED COMPLETION DATE
*Vietnam Veteran Mortality Study	Veterans Administration	To compare mortality patterns and specific causes of death between those veterans who served in Vietnam and those veterans without Vietnam service.	To be Determined
*Vietnam Veteran Identical Twin Study	Veterans Administration	To compare mental and physical health status of identical twin veterans, one who served in Vietnam and one who did not.	1986
Survey of Patient Treatment File	Veterans Administration	To identify morbidity patterns among Vietnam veterans from VA in-patient files.	Initial 1983
*Retrospective Study of Dioxins and Furans in Adipose Tissue	Veterans Administration	To devise a method for determining levels of dioxins and furans in adipose tissue of Vietnam-era veterans from samples in EPA's Survey of Human Adipose Tissue, to identify Vietnam veterans among the tissue samples and to analyze samples.	1985
*Case-Control Study of Soft-Tissue Sarcoma	Veterans Administration	To determine whether Vietnam service, Agent Orange exposure and other factors increase the risk of soft-tissue sarcoma.	1985
*Epidemiological Study of Ground Troops Exposed to Agent Orange	Department of Health & Human Services, Centers for Disease Control	To evaluate possible long-term health effects of Agent Orange exposure on ground troops in Vietnam and to assess possible health effects of Vietnam service; 30,000 veterans expected to participate.	1987

*Birth Defects and Military Service in Vietnam	Department of Health & Human Services, Centers for Disease Control	To determine possible association between Vietnam service and subsequent fathering of congenitally malformed children; based on Birth Defects Registry in Atlanta area which includes families of approx. 5,400 case babies and 3,000 control babies.	Early 1984
Soft-Tissue Sarcoma Investigation	National Institute for Occupational Safety & Health	To study tissues from seven cases of soft-tissue sarcoma in U.S. (4 who had been exposed to dioxin and 3 who may have been) in order to identify patterns of cancer that may be unique among those exposed to dioxin.	Indefinite
Investigation of Leukemia in Madison County, KY	National Institute for Occupational Safety & Health	To determine possible association between cases of leukemia and exposure to wood ammunition boxes treated with hexadioxins.	Fall 1983
Dioxin Registry	National Institute for Occupational Safety & Health	To analyze causes of death among workers at 12 production sites where dioxin-containing products were manufactured.	1985
International Registry of Persons Exposed to Phenoxy Acid Herbicides & Contaminants	National Institute of Environmental Health Sciences, with International Agency for Research on Cancer	To establish an international registry of workers in some 20 plants where phenoxy acid herbicides were manufactured; mortality study planned when enough workers have been added to registry.	Indefinite
Case-Control Study of Lymphoma and Soft-Tissue Sarcoma	National Cancer Institute	To compare herbicide exposure among cases of soft-tissue sarcoma and lymphoma with controls of the same age, sex and Kansas county of residence.	1984

Air Force Health Study	Department of Defense	To compare mortality and morbidity of Air Force personnel involved in Agent Orange spraying in Vietnam with a group of Air Force personnel who were not exposed to the herbicide.	Preliminary Mortality 1983 Complete 1999
*Agent Orange Registry of Vietnam Veterans Biopsy Tissue	Armed Forces Institute of Pathology	To determine disease patterns in biopsy tissue from Vietnam veterans; 1,200 specimens thus far show no unusual patterns, especially of cancer.	Indefinite

* Indicates those studies which are being supported through records research and review by the Army Agent Orange Task Force.

Science Panel
of the
White House Agent Orange Working Group

Represented by the following agencies:

Department of State

Department of Defense

Department of Health and Human Services

Department of Agriculture

Department of Labor

Environmental Protection Agency

Office of Management and Budget

Office of Science and Technology

Veterans Administration

Office of Technology Assessment

Council on Policy Development of the White House

CDC continues to get inquiries regarding the status of its Agent Orange studies. Following is an update, which includes:

Background
Description of the CDC Research Project
    Agent Orange and Vietnam Experience Studies
    Selected Cancers Study
Investigation Results

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BACKGROUND

Between August 1965 and February 1971 approximately 11.3 million gallons of the herbicide 'Agent Orange' (so named because of the orange markings on the drums in which it was shipped) were sprayed over much of South Vietnam in military operations designed to deprive the enemy of cover and food. A chemical contaminant, 2,3,7,8-tetrachlorodibenzo-p-dioxin, more often called TCDD, or simply dioxin, was created during manufacture of and contained in the Agent Orange which was sprayed. Dioxin has been shown to be a highly toxic substance.

In January 1978 the Veterans' Administration (VA) received the first of what was to become many claims from veterans who felt that their current health problems had resulted from their being exposed to Agent Orange while serving in Vietnam. In January 1979 the U.S. Congress enacted legislation (Public Law 96-151) directing the VA to design and conduct an epidemiologic study to determine if exposure to Agent Orange had caused long-term adverse health effects in Vietnam veterans. In November 1981 the scope of the study was expanded (by Public Law 97-72) to include other factors in the 'Vietnam experience,' including medications and environmental hazards or conditions.

In January 1983 the responsibility for designing and conducting the investigation was transferred from the VA to the Centers for Disease Control (CDC). In May 1983 CDC scientists completed detailed guidelines (protocols) for the Agent Orange and Vietnam Experience studies, recommending that a third investigation be conducted at the same time to determine the risk of Vietnam veterans developing selected types of cancers.

Public 'Notice of Research Project Initiation' was published in the Federal Register on March 13, 1984.

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DESCRIPTION OF THE CDC RESEARCH PROJECT

The study includes three separate but related components:

1) Agent Orange Study. (Study of the long-term health effects of exposure to herbicides in Vietnam.)
2) Vietnam Experience Study. (Study of the long-term health effects of military service in Vietnam.)
3) Selected Cancers Study. (Study to determine the risks of specific cancers among Vietnam veterans.)

DESCRIPTION: AGENT ORANGE AND VIETNAM EXPERIENCE STUDIES

Although both of these historical, or 'retrospective,' studies are in some respects similar, each has a separate purpose. The Agent Orange study is designed to find out if troops who were exposed to the herbicide during service in Vietnam have suffered long-term adverse health effects as a result of that exposure. The Vietnam Experience study is designed to demonstrate whether or not there is any difference in the health of veterans of the Vietnam era who served in Vietnam compared to the health of veterans who served in other countries during the same period of time.

The studies require the cooperation of a large number of Vietnam era veterans willing to be interviewed about their health status and experiences before, during, and after those years. TO ENSURE STATISTICAL ACCURACY, NO VOLUNTEERS CAN BE ACCEPTED AS PARTICIPANTS IN THE STUDIES. Participants are selected following scientific guidelines established by the research protocols.

With the help of the Department of Defense and other agencies, CDC will identify a minimum of 30,000 qualified veterans to participate in the studies: 6,000 in each of five separately defined groups or 'cohorts.' The five cohorts are to be made up of veterans who:

1) Served during 1967-68 in a specified area of Vietnam, and were likely to have been exposed to Agent Orange.

2) Served during 1967-68 in the same area of Vietnam as cohort 1, and were less likely to have been exposed to Agent Orange.

3) Served during 1967-68 in another area of Vietnam than cohorts 1 and 2, and were not likely to have been exposed to Agent Orange.

4) Served in Vietnam during 1966-71. Randomly selected from all areas.

5) Served during 1966-71 in countries other than Vietnam.

Data for the Agent Orange investigation will be gathered from cohorts 1, 2, and 3. Cohorts 4 and 5 will provide data for the Vietnam Experience study.

PARTICIPATION IN THE CDC STUDY IS ENTIRELY VOLUNTARY. AGREEING OR DECLINING TO PARTICIPATE IN THE STUDY WILL HAVE NO EFFECT UPON BENEFITS A VETERAN MAY BE RECEIVING OR TO WHICH HE MAY BE ENTITLED IN THE FUTURE.

All information given by each veteran will be held in complete confidence. The names of the participants will never be associated with their answers in the statistical summaries studied by scientists. Names and other identifying information, such as addresses and social security numbers or service numbers, will be kept in a separate file that no one will have access to but the U.S. Public Health Service and the private research firms working on this study. No other researchers or government agencies, including the Veterans Administration and the Department of Defense, will be able to learn if a veteran participated or what his answers were. This promise of confidentiality is guaranteed by Federal laws--42 U.S. Code 242(b), (k), and (m). Unless the veterans gives written permission to CDC to release personal information, no one, including the veteran's family, will ever be able to get the personal information provided by the veteran.

The interview takes about 45 minutes and is conducted by telephone by CDC's contractor, Research Triangle Institute (RTI), Inc. Veterans who are selected to be called by RTI receive a letter from CDC telling them to expect the call. From those being interviewed, approximately 2000 veterans from each cohort will have been preselected for the medical examination component of the study. The RTI interviewers have no control over which veterans will be asked to take the medical exams.

Only veterans who have already been interviewed by RTI will be selected to be asked to take the medical exams which will take 3 days to complete. Several weeks after being interviewed, each veteran selected will receive a letter explaining the examinations and a telephone call from Lovelace Medical Center asking when he can come to Albuquerque. Veterans can select dates convenient to themselves.

The 10,000 medical examinations are being conducted at non-hospital clinical facilities specially constructed for this project by another CDC contractor, the Lovelace Medical Foundation, in Albuquerque, New Mexico. All examinations are being done at the same place to ensure that standard testing procedures are used. The examination includes about 60 physical, psychological, and laboratory tests. Blood and urine samples are required, but no tests are included that most persons would find painful. Participants can refuse to take any test or to answer any question. Veterans who complete all the tests receive a $300 stipend.

Veterans' expenses for travel to and from Albuquerque, food and lodging, etc., will be paid by the government. Veterans will stay in private rooms at a first-class downtown hotel and have their evenings free. Each room will accommodate up to four persons without cost to the veteran. (The government cannot pay for family members' travel or food.)

Physicians and other health providers working on the CDC studies will not provide any treatment for individuals. If a veteran's medical examination indicates the possible existence of a problem of any sort, the veteran will be advised immediately and encouraged to seek treatment from the VA, private, or other sources of medical services.

Veteran interviews for the CDC study began in September 1984, and will continue until about October 1987. The first medical examinations were conducted in March 1985. All examinations are expected to be completed by about January 1988.

RTI, Lovelace, and other non-government research firms have been contracted to collect the data for these studies. These firms are monitored closely by CDC officials. All analysis and interpretation of data is done by CDC.

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DESCRIPTION: SELECTED CANCERS STUDY

There is some scientific evidence that exposure to herbicides may increase the risk of several serious, but relatively rare, cancers in workers in industries which manufacture or use similar products. Because these cancers are so infrequently seen, the 30,000 veterans in the other study cohorts do not offer a large enough sample population upon which to base this investigation. Instead, two other groups will be studied in a 'case-control' investigation. Because of the design of this study, veterans and non-veterans will be included in both the case and control groups. The tumors selected for the study are: lymphoma, soft-tissue sarcoma, nasal and nasopharangeal cancer, and primary liver cancer. Other types of tumors may be added to the study later.

The first (case) group in the Selected Cancers Study will be made up of male patients who have actually had these tumors, and who could have been in the military during the Vietnam conflict. The second (control) group will include men of the same age and from the same current geographic area as the case cohort, but without the tumors.

Using information from interviews and military records, CDC will determine which men in both groups are veterans, which veterans served during the Vietnam era, and which veterans may have been exposed to Agent Orange. Comparison of data collected from both groups may indicate significant differences in their risk of these cancers which could be associated with military service, service in Vietnam, and exposure to Agent Orange.

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INVESTIGATION RESULTS

The exact rate of progress of epidemiological studies of this size cannot be forecast. Collection and analysis of the large amounts of data needed for scientifically valid findings takes time; particularly when so many thousands of veterans must be identified, located, interviewed, and examined.

CDC will report on each component of the study when it has been completed. Final reports on the Agent Orange and Vietnam Experience components are expected by September 30, 1988. The final report on the Selected Cancers Study component is expected by September 30, 1989.

CDC hopes that these studies will provide answers to many of the important questions being asked about Agent Orange and other factors related to service in Vietnam. But, as in every epidemiologic investigation--no matter how carefully designed and professionally conducted--the possibility exists that definitive answers to some questions may never be found.