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**SUMMARY
GEORGIA AGENT ORANGE SURVEY
OF VIETNAM VETERANS**



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GEORGIA SURVEY

The 1982 Georgia General Assembly passed House Bill 1200* entitled "Reports of Veterans Exposed to Agent Orange." A sum of \$67,525 was appropriated for the Department of Human Resources to conduct a questionnaire survey of Vietnam veterans exposed to Agent Orange during the Vietnam conflict.

According to Veterans Administration (VA) estimates, approximately 58,000 Georgians Served in Vietnam. A list of Vietnam veterans was not available from the Georgia Department of Veterans Services to use as a basis for the survey. Therefore, it was necessary to use registers of veterans who took the Agent Orange physical examination being offered by VA hospitals and membership lists from organizations such as Nam Vets of Georgia. In addition, veterans were reached by publicity campaigns and by placing posters, brochures, and questionnaires in Georgia Department of Veterans Services Offices and other locations frequented by veterans throughout the state. Arrangements were also made with Yieling, the state telephone information and referral system, to allow Vietnam veterans to call toll free from anywhere in the state and request a questionnaire. Approximately 26,000 questionnaires were distributed; 9.6% by direct mailing and 90.4% by placement in locations frequented by veterans.

Participation was limited to Vietnam veterans residing in the state at the time of the survey. General objectives were to:

1. Obtain completed questionnaires by March 31, 1983, from the largest possible number of veterans in Georgia who:
 - (a) served in Vietnam, Laos, or Cambodia during the period 1962-1974,
 - (b) currently reside in Georgia,
 - (c) had known or presumed exposure to Agent Orange, and
 - (d) have seen a physician for a health problem believed to be related to Agent Orange Exposure.
2. Verify medical histories given by veterans by querying physicians and/or hospitals identified on veteran questionnaires.

*Sponsored by Representatives Eleanor L. Richardson, Joe T. Wood, Forest Hayes, Jr., Joe Frank Harris, and Paul S. Branch, Jr.

3. Analyze and summarize data from veterans, physicians, and hospitals.
4. Report findings to the 1984 session of the Georgia General Assembly.

Results

As of June 30, 1983, questionnaires were received from 1905 veterans. These questionnaires form the basis for a registry of Vietnam veterans in Georgia whose illnesses are allegedly due to Agent Orange exposure or who have health concerns about Agent Orange exposure. Of the total questionnaires received, 1288 (67.6%) were eligible for inclusion in the survey based on the above criteria.

Questionnaires were received from 124 of Georgia's 159 counties (Figure 1). Approximately 97% of the survey group were males; 65% were white and 30% black. Age ranged from 29-77 years; mean 39.4 years.

Major findings of the survey are contained in the following statements. Interpretation of these findings must take into consideration the fact that 1) the survey targeted veterans who had one or more health conditions which they believe to be related to Agent Orange exposure, 2) a substantial proportion of health conditions reported by veterans were not confirmed by their physicians and may have been reported on the basis of self-diagnosis, and 3) information regarding exposure to Agent Orange is totally dependent upon recall of sometimes uncertain events which occurred 10-15 years ago.

1. 1288 Vietnam veterans in the State of Georgia reported having one or more health conditions which they believe to be related to exposure to Agent Orange. Health conditions reported by more than half the veterans include skin conditions (other than acne), emotional/adjustment problems, nervous system problems, and sleeplessness.

2. Only 52% of survey participants had taken the Agent Orange physical examination offered by VA.

3. A substantial proportion of veterans (29% during their first tour of duty) reported being sprayed with Agent Orange by aircraft.

4. Veterans reported 205 cases of acne with onset after service in Vietnam. Physicians confirmed 29 cases in 119 of these reports (24.4%), but there was no indication that the cases were chloracne (a specific type of acne caused by exposure to dioxin and other chlorinated biphenyls). VA has acknowledged only two or three cases of chloracne in Georgia veterans.

5. Veterans who participated in Operation Ranch Hand (code name for the group who sprayed Agent Orange) reported a significantly higher prevalence of cancer, liver problems, respiratory problems, sexual dysfunction, and chronic pain than other veterans.

6. Veterans who remembered developing some type of illness within 48 hours of exposure to Agent Orange reported a significantly higher prevalence of 12 of 30 medical conditions.

7. Veterans reported 99 cases of cancer, but physicians completing questionnaires on 47 of these confirmed only 10 (21.3%). Theoretically, all Georgia Vietnam veterans (est. 58,000) could have participated in the survey if they have a health problem, including cancer, which they believe to be related to Agent Orange exposure. There are at least two ways to analyze the cancer data:

(a) The first method of analysis involves a comparison of observed to expected cases. Using cancer surveillance data and assuming that the total population of Georgia Vietnam veterans has the same race, sex, and age distribution as the survey group, the expected number of living cases in the total Georgia Vietnam veteran population is 377. If the actual number of cases in the survey group is 10, this would only be three percent of the expected. If the actual number is 21, this would be six percent of expected. If the actual total is 99, this would be 29% of expected.

(b) A second method of analysis consists of comparing the observed prevalence rate of living cancer cases in the survey group to the expected prevalence rate estimated for all Georgia Vietnam veterans. The expected prevalence rate of living cancer cases in the total population of Georgia Vietnam veterans was derived using cancer surveillance data and the assumptions indicated in (a) above. If the actual number of cancer cases in the survey group is only 10, this would give a prevalence rate of 776 per 100,000 which is not significantly different from the expected prevalence rate of 613 per 100,000. If the actual number of cases is 21, the observed prevalence rate would be significantly higher than expected ($p < .01$; Chi-square test). However, these data must be interpreted with caution since the survey design tended to inflate the number of cases of illness in the survey group. The survey design, in fact, does not allow for a determination of whether cancer rates are higher in Vietnam veterans exposed to Agent Orange than in a comparable unexposed population. This and similar determinations must await completion of the large population based study being conducted by the Centers for Disease Control.

8. Negative pregnancy outcomes reported by veterans were less than 6.5% of the number expected for any negative pregnancy outcome among families of all 58,000 Georgia Vietnam Veterans. Pregnancy outcomes were not confirmed by physician questionnaires or other means.

9. The rate of cancer, other than leukemia, for progeny of Vietnam veterans was not significantly different between those children born before and those born after the father's Vietnam service. Veterans reported two cases of leukemia in children born after Vietnam service, but meaningful comparisons were not possible since physician confirmation of these cases was not obtained.

A MORE DETAILED REPORT OF THE STUDY IS AVAILABLE ON REQUEST

RECOMMENDATIONS

This report completes the charge to conduct an Agent Orange survey which was given to the Department of Human Resources by the 1982 Georgia General Assembly. The following recommendations are made as a result of that survey:

1. Consideration should be given to setting up an Agent Orange clearinghouse or phone center which would receive inquiries and complaints from veterans, dependents and others, and would transmit to interested persons information with respect to Agent Orange or dioxin-related matters.
2. Veterans who have not taken the VA Agent Orange physical examination should be encouraged to take the examination at the earliest time.
3. The list of veterans who indicated they participated in Operation Ranch Hand should be checked against military study records to determine whether all these veterans are enrolled in the Ranch Hand Study.
4. The VA should be asked to evaluate or re-evaluate, as the case may be, veterans whose physicians confirmed a diagnosis of acne after age 18 to determine whether they may have chloracne.
5. Agent Orange questionnaires, computer tapes containing data on health conditions, and other pertinent files and records should be transferred to the Georgia Department of Veterans Service for safe keeping and possible use when results are completed on the CDC epidemiologic study.
6. Additional studies regarding the question of Agent Orange exposure and health of Vietnam veterans in Georgia should await the results of the CDC epidemiological cohort study.

SUMMARY OF HEALTH EFFECTS OF DIOXIN EXPOSURE

Agent Orange consisted of an approximately equal mixture of two common herbicides, 2,4-D (2,4-dichlorophenoxy acetic acid) and 2,4,5-T (2,4,5-trichlorophenoxy acetic acid). The latter herbicide contained a small amount (average 2 parts per million) of a chemical contaminant known as TCDD (2,3,7,8-tetrachlorodibenzo-para-dioxin), also commonly referred to as "dioxin." This contaminant, which is formed if the reaction temperature becomes too high during synthesis of 2,4,5-T, has been called the "most toxic man made substance known" because of its highly lethal effects on certain strains of guinea pigs.

To date there are no conclusive studies which causally link TCDD or Agent Orange exposure with excessive mortality or long term health effects in humans. Information on health effects comes almost entirely from animal studies, which are not directly predictive of effects in humans, and from human occupational exposures to herbicides and other chemicals contaminated with TCDD. What is known regarding health effects is briefly summarized in the following paragraphs.

Persons exposed to high concentrations of TCDD by reason of occupation or industrial accident were commonly observed to develop a painful skin condition called chloracne. This condition usually appeared within weeks to months following exposure and persisted for one to several years, depending on the severity of exposure. Other health effects have also been observed in severely exposed persons. For example, a condition known as porphyria cutanea tarda, which is characterized by large blisters of the skin and liver involvement, was reported among at least two groups of exposed workers. In addition, Swedish investigators have recently suggested that there may be a relationship between exposure to TCDD containing herbicides and a form of cancer known as soft tissue sarcoma. However, information to date is not sufficiently completed to establish a cause and effect relationship.

Birth defects were reported among children born to south Vietnamese refugees who sought sanctuary in north Vietnam. A higher rate of birth defects was also reported among infants born to women whose husbands fought in south Vietnam compared to those born to women whose husbands stayed in north Vietnam. Results of these observations are in doubt, however, due to methodological problems attendant with ascertainment of information in a war-torn area. Increased abortion rates were also reported among women living in the Alsea, Oregon area where 2,4,5-T had been used for forest management. An EPA study tended to confirm this report, but the EPA study was later found to have serious problems with incomplete ascertainment of data.

Animal studies have shown that rabbits and monkeys develop chloracne when exposed to subacute doses of TCDD. Subacute exposure has also been shown to produce severe weight loss and porphyria (a disorder of hemoglobin metabolism) in certain animal species.

Carcinogenicity testing of TCDD in rats and mice has yielded results that are difficult to interpret. Increases were observed in cancerous tumors but only at doses which produced other toxic effects. There was a general lack of both organ specificity and linear dose response usually observed with cancer causing agents. In one study a certain strain of mice fed combinations of TCDD and 2,4,5-trichlorophenoxyethanol showed a significantly higher incidence of liver cancer than controls. These observations led investigators to hypothesize that TCDD may be a tumor promoter rather than a primary carcinogen. However, in actual trials in rats and mice, TCDD was not shown to be a tumor promoter. In test systems which employed TCDD and a carcinogenic polycyclic aromatic hydrocarbon, TCDD was observed to inhibit tumor formation by inducing the production of enzymes which converted the polycyclic aromatic hydrocarbons into non-cancer causing metabolites.

In other animal studies, certain strains of pregnant mice showed fetotoxicity and birth defects in their offspring after TCDD exposure; however, exposed male mice were not shown to produce deformed offspring.