

Commentary

Vietnam and Agent Orange Revisited

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Preamble. Few environmental or occupational health issues have received the sustained international attention that has been focused on Agent Orange and its associated dioxin contaminant. For more than three decades, the United States has been involved in controversy over its tactical use of herbicides in Southeast Asia during the Vietnam Conflict. The controversy centered first on the actual deployment of herbicides in South Vietnam, then on the safe disposal of the surplus herbicide following the conflict. Beginning in 1978, concern surfaced on whether herbicides, especially Agent Orange and its associated dioxin contaminant, were responsible for health problems reported among Vietnam veterans. Recently, the controversy has re-centered on the potential impacts of Agent Orange and dioxin on the environment and people of the Socialist Republic of Vietnam, 30 years after its last use in Vietnam.

Why has the controversy continued and what has prompted this most recent interest in Vietnam and Agent Orange? I would like to suggest that there are three on-going activities that have occurred in the past few years that keep Vietnam and Agent Orange in the public and political spotlight. First and foremost have been the decisions by the United States Department of Veteran Affairs to provide compensation to those US veterans who served in Vietnam and who claimed that their health problems were a result of exposure to Agent Orange. Secondly, there have been a series of international publications and symposia highlighting the potential impact of Agent Orange and dioxin on the veterans of the Conflict and Vietnamese who may have been exposed. And lastly, the visit by President Clinton to Vietnam prior to his leaving office and his commitment that the United States Government would provide funding for research studies.

1 Compensation for US Vietnam Veterans Exposed to Agent Orange

The United States Department of Veterans Affairs (DVA) became involved in the issues surrounding Agent Orange in 1978. Station WBBM, a television affiliate of the Columbia Broadcasting System (CBS) in Chicago, Illinois, aired a special report in March 1978 on the subject, 'Agent Orange: Vietnam's Deadly Fog'. This film reviewed a number of past episodes allegedly involving 2,4,5-T herbicide and TCDD. Veterans shown in the film claimed that they had been sprayed with Agent Orange during combat operations in South Vietnam. The television documentary precipitated numerous inquiries with the DVA. The symptoms were the same as the symptoms reported by the veterans in the documentary: numbness in fingers and toes, constant fatigue, weight loss, birth defects, and cancer. In the subsequent twelve years, the United States Government, other governments, institutions, and chemical companies conducted hundreds of studies on populations of individuals, including veterans, potentially exposed to TCDD and/or phenoxy herbicides. The most significant study that was applicable to veterans, who served in Vietnam, was the Air Force Health Study [1]. This was a study initiated in 1980 and is currently on going. It is a health study of the men who served in South Vietnam in Operation RANCH HAND, the military operation responsible for the aerial dis-

semination of Agent Orange and other herbicides from fixed-wing aircraft, 1962–1971.

In 1990, the Office of Technology Assessment (OTA) [2] reviewed a report prepared by the DVA on 'The Association Between Adverse Health Effects and Exposure to Agent Orange'. The OTA recommended that the Department should not take responsibility for reviewing the science on which compensation might be determined, but rather that the DVA should call upon a body of scientists with recognized scientific and medical expertise in fields pertinent to understanding the health effects of exposure to dioxin. In addition however, the Secretary in making decisions regarding Agent Orange compensation for Vietnam Veterans "do so in full recognition that the standard to be applied – as mandated by both Congress and the courts – requires the resolution of doubts in favor of the Vietnam veteran". To ensure that DVA adhered to these recommendations, Congress passed, and the President signed, the Agent Orange Act of 1991, Public Law 102-4.

The Agent Orange Act of 1991 established procedures that DVA must follow in deciding whether to create new presumptions of service connection for disabilities suffered by Vietnam veterans that may be associated with exposure to Agent Orange or other herbicides in Vietnam. The procedures require that DVA contract with the National Acad-

emy of Sciences (NAS) to conduct reviews every two years of the scientific literature on the health effects of herbicides and TCDD. The NAS's Institute for Medicine has issued three comprehensive reports [3,4,5]. In accordance with their findings, DVA has prepared a list of conditions of disabilities that are presumed to be service connected based on herbicide exposure. For any veteran who served in Vietnam between January 9, 1962 and May 7, 1975, and has one of the diseases on that list, DVA must presume that they were exposed to herbicides and their disease is service connected.

The ten diseases or conditions for which the Department of Veterans Affairs currently assume service connection, and therefore provide compensation if the disease is at least 10% disabling [6], include:

- Chloracne or other acneform disease consistent with chloracne (must occur within one year of exposure to Agent Orange)
- Hodgkin's disease
- Multiple myeloma
- Non-Hodgkin's lymphoma
- Acute and subacute peripheral neuropathy
- Porphyria cutanea tarda (must occur within one year of exposure to Agent Orange)
- Prostate cancer
- Respiratory cancers (cancer of the lung, bronchus, larynx or trachea, and must occur within 30 years of exposure to Agent Orange)
- Soft-tissue sarcoma (other than osteosarcoma, chondrosarcoma, Kaposi's sarcoma, or mesothelioma)
- Type 2 diabetes (also known as adult-onset diabetes)

In addition to those conditions recognized as service-connected for veterans, the Department of Vietnam Affairs recognizes two conditions in children of Vietnam Veterans that can be eligible for compensation. These conditions are spina bifida (except spina bifida occulata) and other birth defects in the children of women Vietnam veterans (regulations pending). The DVA publishes the AGENT ORANGE REVIEW, a newsletter distributed to more than 650,000 veterans and others, and which serves as a method of providing information for veterans who served in Vietnam [6].

For the Department of Veterans Affairs, the determination of whether a disease should be service connected is not based on determination of causation or proof of exposure, nor is it based on studies of veterans who served in Vietnam. Rather, it is based on whether the evidence as judged by the NAS is sufficient to conclude that there is a positive association [3]. The NAS reviews available scientific studies from all over the world and is not required to review studies of veterans who served in Vietnam. The NAS must conclude only that "a positive association has been observed between herbicides and the outcome in studies in which chance, bias, and confounding could be ruled out with reasonable confidence. For example, if several small studies that are free from bias and confounding show an association that is consistent in magnitude and direction, there may be sufficient evidence for an association" [3]. Furthermore, as previously noted, in making the final decision on whether an association exists, the Secretary of DVA

must apply the standard, as mandated by Congress and the courts, that any resolution of doubt, favor the Vietnam veteran. There is no legal basis for applying either the Agent Orange Act or the 'standard of doubt' to the situation in Vietnam. The only way to confirm whether Agent Orange and its associated dioxin have had impacts on the environment and peoples of Vietnam is to conduct studies in Vietnam.

2 International Reports and Conferences on the Impact of Agent Orange in Vietnam or on Veterans Who Served in Vietnam

The initial studies of the effects of herbicides in South Vietnam were those conducted by a Committee of the National Academy of Sciences in 1971 through 1973 [7]. In the February 15, 1974, transmittal letter from the President of the National Academy to the Congress of the United States and to the Secretary of Defense, the following four findings were elaborated:

1. "The Committee was unable to gather any definitive indication of direct damage by herbicides to human health. However, to a greater extent than in other areas, there were consistent, albeit large 'secondhand', reports from Montagnards, of acute and occasionally fatal respiratory distress, particularly in children. The inability of the Committee to visit the Montagnards in their own locales so as to verify these tales is greatly regretted. Although these reports did not come from medically qualified observers, the Committee considers it to be important that this matter be pursued at the earliest opportunity."
2. "Attempts to assess the social, economic and psychological effects of the program of herbicide spraying on the peoples of South Vietnam were less than satisfying. Certainly the spraying program on that population now appears relatively trivial as compared with other aspects of the upheaval in that country". About 200 to 300 pounds of TCDD was a contaminant in the 50 million pounds of 2,4,5-T that was dispensed over South Vietnam. "That no serious sequelae have since been definitely discerned is fortunate indeed. However, the continued presence of possibly significant concentrations of this material in fish and in inland rivers, taken as recently as 1973, is considered to be a matter that warrants further attention. On balance, the untoward effects of the herbicide program on the health of the South Vietnamese people appear to have been smaller than one might have feared."
3. "The effects of herbicides on vegetation were largely confined to those resulting from direct contact during spraying. It was found that the various herbicides disappear from the soil at a rate sufficiently rapid as to preclude any significant effect on the next crop of food plants, or on the next growing season of tress, shrubs, etc. All evidence indicates that standing food crops, of all sorts, were highly vulnerable to the spray program. It was not possible, however, to assess the nutritional consequences of that program on the affected local populations."
4. "A major effort of the Committee was devoted to appraisal of the effects of the herbicide spraying program on the forests of South Vietnam. The mangrove forests were found to have been extremely vulnerable.... The bulk of the herbicide spraying was addressed to the large inland forests of South Vietnam, a total of about 6.5%

of the total land area of South Vietnam.... Thus, whereas one cannot rationally assign some dollar value to the herbicide-caused economic loss to Vietnam, either in the past or the near future, there will be serious penalties in the long term unless a commensurate effort is undertaken to prevent them. And, as in the case of the mangrove, there is the burden of conscience to restore these forests to their natural or improved conditions."

Since the NAS 1974 report and its associated parts, there has been a continual interest in conducting studies in Vietnam. However, it was not until fighting had ceased, that in-country studies could be conducted. In 1976, Westing [8] published a book on the 'Ecological Consequences of the Second Indochina War'. In commenting on the use of anti-plant chemicals, he noted that although not an innovation of the Second Indochina War, its use during this conflict was employed at such a profligate level that its use had become inseparably associated with it. In 1984, Westing [9] edited a proceedings of an International Symposium on 'Herbicides in War: The Long-term Ecological and Human Consequences', held in January 1983 in Ho Chi Minh City, Vietnam. In a commentary on the Symposium, Carlson [10] noted that there were more than 160 scientists from 21 countries and delegates from 3 United Nations agencies. Some 72 papers were presented on ecological and health aspects of the long-term effects of military herbicides used in the Vietnam War. He concluded that the Vietnamese wanted to talk science, not politics. They wanted reprints and books, and they wanted to be invited to American and European laboratories and symposia to learn about new techniques and scientific advancements.

Agent Orange and its associated dioxin contaminant has been a topic of interest at each of the past 20 international conferences on 'Chlorinated Dioxins and Related Compounds'. The Second International Symposium (DIOXIN 1981) was held in Alexandria, Virginia. I organized the first session on this topic. We had eight papers presented. The focuses of the early presentations were primarily on environmental fate of Agent Orange and TCDD and the potential routes of human exposure [11]. DIOXIN 1986 was held in Fukuoka, Japan, and it was at this Symposium that the first papers were presented on TCDD residues in tissues of veterans and Vietnamese. It was also at this symposium that the first studies of Vietnamese populations were discussed. Eight presentations were presented by Vietnamese scientists and collaborating colleagues in the special session on 'Observations in Man' [12]. At the 21st International Symposium (DIOXIN 2001), held in Gyeongju, Korea, 22 papers were presented on Agent Orange related topics [13].

At the time of the symposium in Korea, it had been 30 years since Agent Orange had been used in Vietnam, and 20 years from the first time it had been discussed at a DIOXIN symposium (Alexandria, Virginia). Accordingly, a special session was organized on 'Use of Agent Orange in Vietnam: Assessment of Impact on Veterans'. It was noted that four nations provided combat troops, i.e., Allied Forces, to support the Army of Vietnam, 1962–1973. Australia/New Zealand deployed 46,852 combat troops. Korea deployed 312,853 combat troops, and the United States deployed 2.64

million military personnel. No figures were available on either the number of troops deployed by the Republic of Vietnam or the Democratic Republic of Vietnam, but the numbers were likely in the millions [14]. In general, the presentations by government and university scientists were 'good news' for veteran populations. Very few diseases were found to be associated with exposure to Agent Orange or its associated TCDD. More than 200 individuals attended the session and many expressed concern that more time was needed for questions and answers. Two individuals expressed concern that Vietnamese scientists were not given prominence to present studies from Vietnam. However, as noted by the scientists from either the United States Government or from Harvard University's School of Public Health, none of these studies have appeared in the peer-review scientific literature.

Since 1994, a private Canadian company (Hatfield Consultants Ltd.) has collaborated on scientific investigations with a group of Vietnamese scientists (the 10-80 Committee, Ha Noi, Vietnam) to assess and remediate areas of Southern Vietnam (e.g., the Aluoi District) that were subject to aerial spraying of Agent Orange and other military herbicides [15]. Their studies have shown that residual dioxin is still present in the environment, and is being taken up by humans that consume dioxin-contaminated food. However, the Hatfield Reports noted that dioxin contamination is not the only environmental problem resulting from war activities in areas like the Aluoi Valley. In fact, war-related impacts continue to affect large areas of central and southern Vietnam, particularly in border areas with Laos and Cambodia. There are significant unexploded ordnance problems and buried munitions. The military use of Agent Orange and other herbicides may have contributed to such environmental impacts as landslides due to erosion, and loss of biodiversity and forest resources.

In summary, our understanding of the health impacts of Agent Orange on veterans of the Allied Forces that served in the Vietnam Conflict is reasonably complete and encouraging. However, our scientific information base on the environment and peoples of Vietnam continues to be limited, and the need for increased research is acknowledged.

3 Presidential Visit and the Commitment to Research Funding

In February 2000, the Secretary of Defense and Department of State personnel visited Vietnam in preparation for a visit later that year by President Clinton. One of the topics discussed during the visit was Agent Orange, and a tour was conducted of two airbases where RANCH HAND aircraft were stationed and Agent Orange stored during the Vietnam conflict [16]. Following their return to the United States, the National Institute for Environmental Health Sciences (NIEHS) was authorized to begin the planning of an appropriate research program that would be done in collaboration with Vietnamese and United States scientists with funds being provided by the United States. Indeed, recommendations were provided to the White House, and President Clinton discussed these recommendations while on his visit to Vietnam prior to leaving the Presidency.

In March 2002, a joint meeting co-sponsored by NIEHS and the Vietnamese Ministry of Science, Technology and the Environment was held in Hanoi [17]. The conference was organized under the auspices of a Joint US-Vietnam Cooperative Research Program on the Health and Environmental Effects of Agent Orange/Dioxin. Experts from throughout the world were invited to provide a broad assessment of the data available on the health and environmental effects of Agent Orange and dioxin and the needs of future research. In a Memorandum of Understanding that was signed by both governments, the US Ambassador to Vietnam stated: "This agreement and the scientific conference that preceded it mark a new step forward in our relations with Vietnam. It is too soon to predict what the eventual benefits will be, but it is certain that Americans and Vietnamese working together in pursuit of a common interest can achieve a great deal". Indeed, scientists from the Vietnamese Ministry of Science, Technology and the Environment, the Vietnamese Ministry of Health, the US NIEHS, the US Environmental Protection Agency and the US Centers for Disease Control and Prevention established a research agenda that addressed two major areas of research: direct research on human health outcomes from exposure to dioxin, and research on the environmental and ecological effects of dioxin and Agent Orange. A process for obtaining funding and guiding the research was also proposed [17].

4 Conclusions

The challenges for any proposed cooperative research program with Vietnam will be in obtaining both the policy concurrence of the new Administration, and the funding for this program from the Congress. This will require support from both the public and the scientific community in the United States. Indeed, magazine and newspaper articles about Vietnam, the Vietnam Conflict and Agent Orange are becoming 'popular' in the United States, and the public and the scientific communities are recognizing the need for research in Vietnam. For example, the newspaper USA TODAY for March 16, 2000, had a very extensive article on the need for a joint study of Agent Orange [18]. However, one of the most significant quotes in the article was from a member of the Vietnam Veterans of America. He stated: "The biggest fear of our government is compensating Vietnamese victims, and the biggest fear of the Vietnamese is that it would shut down the country in terms of business". Another article in the January/February 2000 issue of the magazine MOTHER JONES [19] noted: "Though Vietnam believes that hundreds of thousands of its citizens are victims of Agent Orange, remarkably little has been proved with scientific certainty about the consequences of America's chemical warfare in the 1960s. Unable to devote sufficient resources to research, and lacking laboratory technology required to study minute levels of dioxin contamination, Vietnam is well aware of its inability to quantify the problem with precision". The March 2002 Conference in Hanoi received coverage in most major newspapers and magazines across the United States [20].

This interest portends well that the public and the scientific community of the United States will support, albeit small, a

research program in Vietnam. Time will tell whether the Vietnam War and the issues surrounding the use of Agent Orange will become a topic that will muster only a passive interest by scholars. Clearly this will not occur until we are willing as a society to invest in the needed research to understand what really happened in Vietnam.

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