

Some veterans of Operation Desert Shield/Desert Storm (ODS/DS) have reported an array of health complaints, including fatigue, joint pain, skin rash, memory loss, and diarrhea. Many of these veterans attribute their poor health to deployment to the Persian Gulf. Whether these veterans are experiencing higher-than-expected rates of identifiable illnesses with known etiologies or other illnesses of unknown origins is the subject of a great deal of on-going research.

This study was commissioned by the Special Assistant to the Deputy Secretary of Defense for Gulf War Illnesses to help quantify how pesticides were used during ODS/DS because overexposure to pesticides can cause symptoms similar to those reported by some Gulf War veterans. The goal of this survey is to quantify pesticide use by the average soldier during ODS/DS: Which pesticides were used, who used them, and in what quantities. Our results complement other data collection efforts by the Department of Defense, such as interviews with military preventive medicine personnel and entomologists. Designed as one part of the larger research effort, this survey provides information only about pesticide use; it was *not* designed to investigate whether such use is related to health outcomes or symptoms.

Two other reports, to be published concurrently with this one, examine the literature on the known effects of pesticides on health and the possible effects of pesticides on troops in the Gulf War. One examines the latest scientific knowledge about the possible human health effects of pesticides (see Cecchine et al., forthcoming). The other, being prepared by the Office of the Special Assistant for Gulf War Illnesses (OSAGWI), investigates what happened in the Gulf and its likely effect on the service members who served there. They will provide additional information about pesticides that, in conjunction with the information in this report, may help address the broader question of health effects for veterans of ODS/DS.

The results in this report are a significant contribution to the broader question because little is known about the use (or misuse) of pesticides during the Gulf War. Before this survey, logistics information quantifying the amount of military-issue pesticides ordered from the theater of operations and interviews with preventive medicine personnel provided the best available data on pesticides used in ODS/DS. However, that information failed to account for pesticides acquired outside of the military supply system and provided little information about how pesticides were used by the average soldier.

In an effort to gather additional information, this survey was designed to solicit detailed data both on pesticides personally used by individuals and pesticides used or observed in the field. The data consist of telephone interviews with 2,005 veterans who were randomly selected to be statistically representative of the entire Gulf War population on the ground in the Kuwaiti theater of operations. The complete survey instrument is available as a RAND report (Spektor, Reardon, and Cotton, forthcoming), and the data we collected¹ are available on the World Wide Web at <http://www.rand.org/natsec/gulfwar.html>.

The audiences for whom this report is intended include military and civilian officials responsible for doctrine and policy related to the employment of pesticides in the U.S. military, the protection of the health of U.S. military personnel, and the conduct of supporting medical and scientific research. This report may also be of interest to Gulf War veterans and veterans' groups concerned with the issues surrounding Gulf War illnesses, as well as to the American public at large concerned with policies related to the protection and treatment of U.S. military personnel.

This research is sponsored by the Office of the Special Assistant to the Deputy Secretary of Defense for Gulf War Illnesses and was carried out jointly by RAND Health's Center for Military Health Policy Research and the Forces and Resources Policy Center of the National Defense Research Institute (NDRI). NDRI is a federally funded research and development center sponsored by the Office of the Secretary of Defense, the Joint Staff, the unified commands, and the defense agencies.

This report is one of several by RAND commissioned by the Special Assistant for Gulf War Illnesses. Other reports address the military use of certain drugs not yet approved by the Food and Drug Administration and review the scientific literature on the health effects of chemical and biological agents, pyridostigmine bromide, oil fire pollution, depleted uranium, pesticides, infectious diseases, immunizations, and stress.

¹Appropriately de-identified to protect survey participants' anonymity.