

This literature review, one of eight commissioned by the Special Assistant to the Deputy Secretary of Defense for Gulf War illnesses, summarizes the existing unclassified scientific literature on the health effects of selected chemical and biological warfare agents that may have affected service members who served in Operations Desert Shield and Desert Storm. The eight RAND reviews are intended to complement efforts by the Department of Defense and other federal agencies as they attempt to understand the full range of health implications of service in that conflict. The reviews largely reflect data from 1997 and earlier but contain some from 1998 and later.

While many veterans have reported an array of physical and mental health complaints since the war, the extent to which veterans are experiencing either unusual rates of identifiable illnesses with known etiologies or any other illnesses from as yet unidentified origins is not yet clear.

The other seven RAND literature reviews deal with oil fire pollution, depleted uranium, pesticides, pyridostigmine bromide, immunizations, infectious diseases (which includes review of two biological warfare agents, anthrax and botulinum toxin), and stress, all potential factors in some of the illnesses Gulf War veterans have reported.

These reviews are intended principally to summarize the scientific literature on the known health effects of given exposures to these risk factors. Where available evidence permits, the reviews also summarize what is known about the range of actual exposures in the Gulf and assess the plausibility of the risk factor as a cause of illnesses. These broader statements should be regarded as suggestive rather than definitive because much more research both on health effects and exposures remains to be completed before more definitive statements are made. Recommendations on necessary additional research are also made when appropriate.

These reviews are limited to literature published or accepted for publication in peer-reviewed journals, books, government publications, and conference pro-

ceedings. Unpublished information, such as reports or Internet notes, was occasionally used, but only to develop hypotheses or, in the case of press reports, for historical background. The reports are written for a professional and technical audience using unclassified sources.

This monograph was submitted for peer review in summer 1998. Some selected articles that appeared in the literature after that date are also referenced in the monograph, principally to accommodate reviewer recommendations.

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